

Final Report

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Grantee Name: Centre for Marineline Conservation and Community Development

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This report describes activities carried out in support of Socioeconomic Monitoring for Coastal Resource Management Projects in Vietnam & Cambodia from 2008 to 2010. This report was compiled by Nguyen Thu Hue, Director of MCD and Minh Hoang, Head of Coastal Resources Management Department.

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Glossary

SocMon SEA	Socioeconomic Monitoring Southeast Asia
FACT	Cambodia Fisheries Action Coalition Team
LMMA	Locally Managed Marine Area
MCD	Centre for Marinelife Conservation and Community Development
MPA	Marine Protected Area
NGO	Non Governmental Organization
NOAA	National Oceanic and Atmospheric Administration
PMCR	Participatory Management of Coastal Resources Project
ToT	Training of Trainer

Project Title: Socioeconomic Monitoring for Coastal Resource Management Projects in Vietnam & Cambodia

Project Summary:

Responding to the dual need to improve coastal resource management in S.E. Asia through targeted management interventions informed by a better socioeconomic understanding of site conditions, as well as the need to develop in country knowledge and expertise in socioeconomic monitoring, this project proposes a Vietnamese-Cambodian partnership to implement SocMon SEA methodology at four project sites. Proposed activities include a SocMon SEA training workshop with a training of trainers component, implementation of pilot socioeconomic monitoring projects at four marine conservation sites, and a convening workshop to share results and lessons learned.

Project Goal:

The overall goal of this project is to improve the management of coastal resources in Viet Nam and Cambodia through the implementation of integrated coastal management plans that are guided by the results and recommendations of socioeconomic monitoring at four selected sites. The project will also develop a cadre of socioeconomic monitoring experts in these two countries.

Project Objectives:

Project objectives are to:

- Develop SocMon SEA expertise among partners sufficient so that these partners can both implement the SocMon methodology on their own as well as instruct others in the SocMon conceptual framework/methodology.
- Organize and implement socioeconomic monitoring pilot exercises at the four proposed project sites in order to better understand the relationship between community/household demographics, coastal/marine activities, governance, attitudes, infrastructure, material style of life, and the status of reef resources at these sites.
- Share data/lessons learned amongst stakeholders and partners in order to improve site specific management programs.

Project Stakeholders:

- Quang Nam Department of Fishery Resources Protection and Exploitation
- Management Board of Trao Reef Locally Managed Marine Area

- Ninh Thuan Department of Fishery Resources Protection and Exploitation
- Cambodia Fisheries Action Coalition Team

Summary of Project Activities and Achievements

<i>Activities</i>	<i>Outcomes/Outputs</i>	2008	2009				2010	
		Q4	Q1	Q2	Q3	Q4	Q1	Q2
1.1 Set up a project partnership arrangement among selected organizations for joint learning.	<ul style="list-style-type: none"> - 04 sub-agreements between MCD and the project partners have been signed - 04 SocMon working groups in 04 project sites have been built 							
1.2 Translate SocMon SEA into Khmer for the use of Cambodian project participants.	- 01 SocMon SEA guideline has been translated into Khmer							
1.3 Distribute hard and electronic copies of SocMon SEA to project partners.	- 18 hard copies of SocMon SEA guideline in Khmer has been distributed to stakeholders in Cambodia by FACT							
1.4 Conduct a training needs assessment (TNA) for SocMon training workshop participants.	<ul style="list-style-type: none"> - 01 form of questionnaire to assess the training need of SocMon working groups has been designed and sent to 05 institutions/agencies in Vietnam and Cambodia - 16 filled questionnaires have been collected - 01 TNA synthesis report has been compiled 							
1.5 Conduct a training workshop with a training of trainers (ToT) component for project partners based on the	<ul style="list-style-type: none"> - 01 training workshop has been designed - 22 participants have been trained on SocMon SEA by 01 international 							

<p>SocMon SEA framework and methodology.</p>	<p><i>expert</i></p> <ul style="list-style-type: none"> - 02 questionnaire forms have been designed to support the field exercise and facilitate the participants to practice their SocMon skills - 01 practice exercise in the field has been conducted - 01 questionnaire of post training survey has been designed - 01 workshop proceeding has been compiled 							
<p>2.1 Select appropriate indicators and develop site specific implementation plans for socioeconomic monitoring pilot exercises at 4 project sites.</p>	<ul style="list-style-type: none"> - 04 implementation plans and 04 sets of SocMon indicators have been built by 04 SocMon working groups - 04 appropriate sites have been selected for SocMon pilot exercise by the project stakeholders 							
<p>2.2 Train site resource managers in field data collection in order to build on-site capacity for socioeconomic monitoring. Provide mini workshops where required for site resource managers on data collection methodologies and data storage techniques.</p>	<ul style="list-style-type: none"> - 04 local trainings have been designed - 36 local villagers and officers in 04 sites have been trained on the information collection skills by 04 SocMon working groups 							
<p>2.3 Implement a socioeconomic monitoring pilot exercise at each project site in order to gain experience in data</p>	<ul style="list-style-type: none"> - 08 questionnaire forms have been designed to collect the data of selected SocMon indicators - 04 survey teams with the 							

<p>collection/analysis and in order to assess the suitability of the SocMon SEA methodology to site conditions.</p>	<p><i>participation of 53 villagers and officers have been established</i></p> <p><i>- 638 households and 18 key informants have been interviewed by questionnaires</i></p>							
<p>3.1 Process and analyze results. Input data into SocMon database.</p>	<p><i>- 08 database sets of SocMon indicators have been designed and filled with the data collected</i></p> <p><i>- The data has been analyzed and interpreted</i></p>							
<p>3.2 Each partner prepares an evaluation report for their site outlining, the methodology used, results, problems/challenges in data collection, lessons learned and implications for site management.</p>	<p><i>- 04 evaluation reports have been accomplished by 04 SocMon working groups</i></p>							
<p>3.3 Convene a reporting and sharing workshop for project partners.</p>	<p><i>- 01 final workshop have been organized with the participation of 45 participants from 20 departments/organizations of Vietnam and Cambodia</i></p> <p><i>- 01 workshop proceeding has been completed</i></p> <p><i>- The results, lesson learnt and challenges of SocMon implementation have been shared among SocMon practitioners</i></p> <p><i>- 04 follow-up workplans of 04 project sites have been designed by the project stakeholders</i></p> <p><i>- 01 lesson learnt paper of SocMon project</i></p>							

Highlights from SocMon Survey completed in Khanh Hoa province, Vietnam

Khanh hoa province is located in central part of Vietnam with well known tourism city of Nha Trang. It takes 2 hour flight from Hanoi capital then 60 minutes driving to reach the project site.

The results of the 2009 SocMon survey conducted in Xuan Tu 2 village, Van Hung commune, Van Ninh district, Khanh Hoa province are summarized in the followings:

- Xuan Tu 2 village has an area of 80ha with 2,735 people of 553 households. This village located adjacent to Trao Reef Marine Ecosystem Protected Area - the first locally managed marine area (LMMA) in Vietnam
- 75% of total households involved in fishery activities.
- Average income of households is 550,000 VND / person / month
- 281 households were interviewed accounting for 51% total households of the village
- 60% of respondents do fishery activities for a living
- Although the fishery capture is the most occupation used by the respondents (33.57%), the key income source of respondents from aquaculture accounting for the highest proportion (41.45%).
- 71% of respondents answered "Don't agree" with the question: "Coral reefs are only important if you fish or dive".
- 75% of respondents answered "Disagreed" with the question: "Seagrass beds have no value to people".
- About 57% of respondents reported about the "very good" status of coral reef
- About 59% of respondents reported about the "good" status of mangrove
- About 63% of respondents reported about the "unchanged" status of sea grass
- 100% of respondents were aware of and support Trao Reef Marine Ecosystem Protected Area
- 95% of respondents learnt about the snout otter clam culture model supported by MCD and 75% of respondents recognized their need of access to loans to do this model.

Highlights from SocMon Survey completed in Ninh Thuan province, Vietnam

Ninh Thuan province is located in central part of Vietnam, neighboring to Khanh Hoa province. It takes 2 hour flight from hanoi capital then 2 hours driving to reach the project site.

The results of the 2009 SocMon survey conducted in My Hiep village, Thanh Hai commune, Ninh Hai district, Ninh Thuan province are summarized in the followings:

- My Hiep village has an area of 30 ha with a total of 168 households and 762 people, in which female is accounting for 51.97% of total population.
- 119 households were interviewed, accounting for 70.83% of total households
- 100% of respondents are educated at the level of primary.
- The key income sources of respondents are listed respectively as: fishing accounting for 74.8%; agriculture accounting for 16.8% and small trade accounting for 8.4%.
- 67% of respondents have fishing vessels for fishery exploitation.
- 100% of respondents do inshore fishing during the whole year.
- 93.2% of respondents know about the banned fishing activities.
- 100% do not violate the law or regulations on fisheries
- 89.9% of respondents have not involved in any community group yet.

Highlights from SocMon Survey completed in Preak Shihanouk, Cambodia

Preah Sihanouk known as "Kampong Som" province is located along the sea and South Western side of Cambodia. It takes about 4 hours by bus from Phnom Penh then 3 hours by boat to reach the project site.

The results of the 2009 SocMon survey conducted in Prek Svay village in Koh Rong island, Koh Rong province are summarized in the followings:

- Koh Rong is the second largest island in Cambodia covering an area of approximately 9,997 ha
- Prek Svay is one of 4 villages in Koh Rong island with the total households of 148 families. Total populations are 677 persons, of which 319 persons (47%) are female.
- Over 90% villagers has educational level of primary
- 17.29% households considered fishing as primary occupation while 30.2% of respondents noted income from fishing as their primary income source

- 43 households were interviewed during this survey occupying for 29.05% of total households in Prek Svay.
- About 90 % of the respondents described resource conditions of coral reefs, mangroves and freshwater environment as 'good', 'very good' or 'excellent'.
- Around 70% described conditions of fish, sea grass and upland forests above average conditions.
- 61% of the respondents engage in fishery and 51% in farming
- More than 80% noted over fishing and solid waste are the two major perceived threats in the area.
- 67% of the respondents considered that the reefs were important for protecting land from storm waves.
- 73% of respondents said clearing coral reefs could reduce the quality of fishing while 58% of them answered that mangroves were important to marine ecology and clearing them could adversely affect the fish habitat.
- 67% of the respondents think that coral reefs are important not only for fishing, but also for diving.
- 95% of respondent said that the future generations should also enjoy the mangroves and coral reefs and 88% of them admitted that they should restrict development in some coastal areas so that the future generations would be able to have natural environments
- 95% of the respondents answered that fishing should be restricted in certain areas even if no one ever fishes in those areas just to allow the fish and coral to grow, while 67% of them think sea grass beds have value to people.
- More than 95% of respondents think that an area with diverse coral reef could lead to an increase of tourists to the area.
- 97.7% respondents were willing to participate in protection and conservation of coastal and marine resources.
- Over 70% respondents have high awareness of fisheries rules and regulations.
- Over 50 percent of the respondents answered that they were perceived to be complying with rules and regulations and that rules and regulations were enforced
- More than 50 percent of the respondents felt that they have not participated in preparation of local by-laws, patrolling, suppression of illegal activities (law enforcement), advocacy, networking and fundraising.

Achievements and Impacts

Objective 1: Develop SocMon SEA expertise among partners sufficient so that these partners can both implement the SocMon methodology on their own as well as instruct others in the SocMon conceptual framework/methodology.

At least 22 people from the project partners have been strengthened in terms of the essential knowledge and skills competent to plan and implement relevantly a coastal socio-economic monitoring assessment via ToT training and practice exercise in the field. They are also capable of selecting and using appropriately SocMon indicators to understand the interaction between the socio-economic context and coral reef status in the coastal area and island. Additionally 12 trained members of 04 SocMon working groups in the project sites have done successfully the local trainings to increase the understanding of 36 local villagers and officers about SocMon theory and mobilize these "secondary trainees" in collecting data for SocMon pilot exercises.

Objective 2: Organize and implement socioeconomic monitoring pilot exercises at the four proposed project sites in order to better understand the relationship between community/household demographics, coastal/marine activities, governance, attitudes, infrastructure, material style of life, and the status of reef resources at these sites.

The socioeconomic monitoring pilot exercises have been planned and conducted by 04 SocMon working groups in the selected sites to collect data relevant to SocMon indicators. As a result 638 households and 18 officers of local authority have been interviewed by questionnaires and direct discussions. These assessments demonstrated that fishery resources at the surveyed sites are diverse and very important to local villagers because of their independence on these resources as a key income source of family (over 50% local populations get involved in fishing activities for a living). Most of local fishermen are using the coastal area as a primary fishing ground where they can catch any fishery species they encounter by their simple fishing tools. The fishery resources are under the significant threats of over-exploitation, destructive fishing and environment pollution from rubbish. The regulations of fishery protection adopted by Government are understood comprehensively by local fishermen but their compliance with these rules is irrelevant.

Objective 3: Share data/lessons learned amongst stakeholders and partners in order to improve site specific management programs.

The results and lessons learnt from the pilot exercises of SocMon implementation have been summarized and documented in the evaluation reports by 04 SocMon working groups in 04 project sites. These reports have been not shared only between the project partners but also to other stakeholders via a sharing workshop with the participation of 45 people. Some key suggestions to improve site specific management programs are described briefly as below:

- Strengthening the patrolling and enforcement mechanism, especially collaborating with other sectors such as community, NGOs, ect.

- Strengthening the awareness and education program to disseminate the policies and guidelines of Government
- Support the local fishermen to participate in the vocational conversion and livelihood diversification programs
- Support the local fishermen with the funds to improve the fishing equipment for off-shore fishing
- Establishing community based coastal resources management models and support with capacity building, especially resources monitoring skills

Additionally 04 action plans have been designed by 04 project partners to improve their SocMon skills and integrate SocMon methodology into their monitoring process of management effectiveness.

Constraints and measures taken

The component program in Cambodia started later than expected due to the change of project partner. It is the fact that Participatory Management of Coastal Resources (PMCR) of Cambodia Environment Department is the original partner, however they could not continue their participation in the project due to their over workload and the commitments to other existing projects. Therefore more time has been devoted to seeking other partner to implement the component program of SocMon project in Cambodia. As a result Fisheries Action Coalition Team (FACT) has been selected.

The pilot exercise of SocMon implementation has been affected unexpectedly by calamity. In September, 2010 a big storm attacked the central part of Vietnam where the project sites are located, causing serious losses to the local residents. Therefore most SocMon pilot field exercises in Vietnam have been delayed as the local people have to deal with the consequences caused by the storm. Due to this unexpected interruption, a no cost extension of 3 more months was proposed to and approved by NOAA so that SocMon working groups in Vietnam and Cambodia had more time to accomplish their activities.

The data analysis is the big challenge to SocMon working groups of this project due to their unfamiliarity with the analytical assessment. Although the data collected from the pilot exercises were numerous, the data interpretation to find the results presented in the reports was very limited. Therefore a plan to train SocMon working groups on SocMon data analysis capacity and reporting skill was to integrated into the follow-up workplans of project partners.

Evaluation of the socio-economic monitoring methods used

Generally the method is quite simple and flexible to apply in the coastal area. Data collection by interview is familiar to surveyors and easy to get local villagers involved. The method also is not necessary to include the equipment or special tools to implement hence there is no need of technical training. However this method is often

used in the coastal and marine areas where the access by travel is significantly difficult and expensive, especially islands.

Household indicators such as H9, H17, H18, H21, H22, H23, H24, H25, H26, and H27 should be considered to include in exercise of focus group discussion. This would particularly help to collect the overall answers towards each question given by the normal community people. The answers should be scrutinized in order to standardize the answers once applied during the household survey.

Budget

Due to the postponement of the filed pilot exercises the expenditures were behind schedule but by the end of the project the whole fund has been spent entirely as planned. The fund by NOAA was used to support SocMon working groups to organize and implement the project activities such as SocMon training, SocMon planning, SocMon implementing, SocMon information sharing. The matching contribution of partners was mostly used to pay for the salary of organization staffs involved in the project and other office supplies and expenses.

Lessons learnt

From the technical perspective:

Sharing of the vision built among partners is a critical point for the project success. Using local partner staff to conduct survey through training of trainers and field practices have contributed greatly to capacity building and ensuring the project sustainability.

Integrating SocMon process into institutional tasks and sharing of the assessment results to project stakeholders are very important to create impact.

From the logistic perspective:

The most important lesson learnt during the project implementation was that the risk management was required to take into account during the whole process of project implementation. It is critically necessary to deal with the unexpected problems such as the management of change in project partner; influence of calamity, ect. and make sure to meet the project schedule.

Email and telephone were needed to use simultaneously in order to update and confirm the information between the project partners.

Recommendations

In order to enable SocMon methodology to be applied more extensively and effectively in Vietnam and Cambodia some suggestions are described as below:

- The potential sites suitable to apply SocMon methodology need to be identified and a further funding is needed to implement SocMon exercises. Marine

protected areas should be considered as the good potential candidates for this suggestion.

- SocMon trained staffs who have involved in this project are required to participate in an advanced training to improve their skills of data analysis and ToT. These people are also considered as the potential resource persons to develop SocMon activities in the future.
- A network of SocMon practitioners in Vietnam and Cambodia should be established and maintain via the exchange and sharing of practical results amongst stakeholders and with SEA regional SocMon network to strengthen SocMon expertise.

Appendix 1 - List of relevant stakeholders to be distributed SocMon guideline Khmer version by FACT

No	Name of Stakeholders	Location	Number of copies
1	LICADHO	Preah Sihanouk	1
2	ADHOC	Preah Sihanouk	1
3	Department of Fisheries	Preah Sihanouk	1
4	Department of Environment	Preah Sihanouk	1
5	CNRO	Preah Sihanouk	1
6	Build Bright University (BBU)	Preah Sihanouk	1
7	University of Management and Economics (UME)	Preah Sihanouk	1
8	LICADHO	Kampot	1
9	ADHOC	Kampot	1
10	STT	Kampot	1
11	YCC	Kampot	1
12	SCW	Kampot	1
13	CWDCC	Kampot	1
14	AFSC	Koh Kong	1
15	MPT	Koh Kong	1
16	KAHS	Koh Kong	1
17	RUPP(Department of Environment)	Phnom Penh	1
18	RUA (Graduate School)	Phnom Penh	1

Abbreviation:

LICADHO: Cambodian League for the Promotion and Defense of Human Rights

ADHOC: The Cambodian Human Rights and Development Association

CNRO: The Cambodian National Research Organization

STT: Sahmakum Teang Tnaut

YCC: Youth Cambodian Committee

SCW: Save Cambodian Wildlife

CWDCC: Children and Woman Development Center in Cambodia

AFSC: American Friend Service Committee

MPT: Mlup Prumvihea Thor

KAHS: Khmer Ahim Sa

RUPP: Royal University of Phnom Penh

RUA: Royal University of Agriculture

Appendix 2 - Participants List of Workshop on Sharing Experience Of SocMon Implementation in Vietnam and Cambodia

Ninh Thuan, April 21-22, 2010

Number	Full name	Departments
<i>Ninh Thuan province</i>		
1	Nguyen Hanh	Department of Natural Resources and Environment, Ninh Thuan
2	Huynh Viet Kim	Director, Nui Chua National Park Management Board
3	Pham Anh Dung	Ecotourism Division, Nui Chua National Park Management Board
4	Nguyen Sy Hung	Ecotourism Division, Nui Chua National Park Management Board
5	Nguyen Tien Thanh	Ecotourism Division, Nui Chua National Park Management Board
6	Nguyen Tan Tung	Deputy Director, Department of Natural Resources and Environment, Ninh Thuan
7	Nguyen Quang Dao	Department of Science and Technology Ninh Thuan
8	Pham Thanh Hung	Department of Science and Technology Ninh Thuan
9	Van Canh	Ninh Thuan Television
10	Xuan Duy	Ninh Thuan Television
11	Hoai Huong	Ninh Thuan Television
12	Nguyen Kim Long	Division of Capture Fisheries and Fisheries Resources Protection, Ninh Thuan
13	Nguyen Duc Chien	Division of Capture Fisheries and Fisheries Resources Protection, Ninh Thuan
14	Diep Nghia Hung	Local villager, My Hiep village, Thanh Hai commune, Ninh Thuan province

Number	Full name	Departments
15	Nguyen Khac Hoa	Leader of People's Committee of Thanh Hai commune
16	Nguyen Nhu Hien	Vice chairman, People's Committee of Ninh Hai district, Ninh Thuan
17	Vo Cong Ha	Department of Planning and Investment, Ninh Thuan
18	Nguyen Xuan Vinh	Institute of Tropical Biology
19	Luong Duc Thien	Institute of Tropical Biology
20	Tran Thanh Thuy	Institute of Tropical Biology
21	Bui Xuan Minh	Local villager, Vinh Truong coral reef, Phuoc Dinh, Ninh Thuan
22	Nguyen Xuan Binh	Ninh Thuan newspaper
23	Nguyen Thai Huyen Suong	Department of Planning and Investment, Ninh Thuan
24	Pham Thanh Binh	Department of Culture, Sport and Tourism, Ninh Thuan
25	Phan Que Tran	Department of Natural Resources and Environment, Ninh Thuan
26	Thai Van Hiep	Department of Natural Resources and Environment, Ninh Thuan
<i>Khanh Hoa province</i>		
27	Dang Tri Thong	Management Board of Trao Reef Marine Ecosystem Protected area
28	Ho Tho	Local villager, Xuan Tu 2, Van Hung commune, Van Ninh district, Khanh Hoa province
29	Thieu Quang Khoa	Local villager, Xuan Tu 2, Van Hung commune, Van Ninh district, Khanh Hoa province
30	Nguyen Nhu Dao	Division of Capture Fisheries and Fisheries Resources Protection, Khanh Hoa
<i>Quang Nam province</i>		
31	Tran Quang Kien	Division of Capture Fisheries and

Number	Full name	Departments
		Fisheries Resources Protection, Quang Nam
32	Nguyen Dinh Toan	Division of Capture Fisheries and Fisheries Resources Protection, Quang Nam
33	Nguyen Huynh Nam	Division of Capture Fisheries and Fisheries Resources Protection, Quang Nam
34	Bach Ngoc Lan	Local villager, Dua Reef, Tam Hai commune, Quang Nam province
<i>Cambodia</i>		
35	Chourn Bunnara	Fisheries Action Co T
36	Khin Saravuth	Officer of Fisheries Department, Preak Sihanouk province, Cambodia
37	Teng Sophy	Preak Sihanouk province, Cambodia
38	Seak Sophat	DES/Royal University of Phnompenh, Cambodia
<i>Centre for Marinelife conservation and Community Development - MCD</i>		
39	Nguyen Thu Hue	Director
40	Minh Hoang	Head of Coastal Resources Management Department
41	Vu Thi Thao	Officer of Coastal Resources Management Department
42	Tang Duyen Hong	Head of Community Development Department
43	Le Thanh Hai	Assistant of Community Development Department
44	Hoang Thu Oanh	Assistant of Communication Department
45	Le Nguyen Khoi	Officer of MCD Khanh Hoa

Appendix 3

**Socio-economic Monitoring of Coral Reef
in Thuan An village, Tam Hai commune, Nui Thanh
district, Quang Nam province**

An Assessment Report

Submitted to: MCD

Date of submission: March 30, 2010

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ABSTRACT

Objectives of the report:

To summarize the implementation process and socioeconomic monitoring (SOCMON) results in 2009 in area of Thuan An village, Tam Hai commune - Nui Thanh district - Quang Nam province; lessons learnt and recommendations in the management and protection of fisheries resources associated with the livelihood issues of coastal communities, SocMon working group of Quang Nam developed this summary report. We hope that these results will contribute actively to research, coastal resource management, supplementary information for previous research on this area as well as SocMon data of Southeast Asia area.

Summary of findings

- Thuan An village covers about 1.2 km² (120ha) with 432 households and 1582 inhabitants. The village has unfavorable natural conditions, limited transportation as well as information exchange. Also, it was often affected directly by severe climate events in coastal area.
- 80.1% of total households are poor or just have enough food to eat.
- 16.1% people at education level of primary, 70.9% secondary and only 12.1% high school and higher. Educational level of people in village is still low compared to the average of the commune and district.

199 local households were interviewed representing 46.06% of total households in Thuan An.

- All (100%) of households interviewed involve in fishing, of these, 67.3% of respondents live by this occupation only.
- 99% of respondents depend on coastal resources.
- 76.9% of respondents think that fisheries resources now are less than 10 years ago while 19.6% believed that resources are exhausted.
- 97,5% of interviewed villagers are well aware about the protection of fisheries resources, the State regulations as well as benefits of fisheries resources protection for life.

However, only 78.4% respondents are support and willing to implement regulations of fisheries resources protection.

Summary of conclusions

Thuan An village, Tam Hai - Nui Thanh has disadvantage natural conditions. Its geographical location is not convenient for transportation, information exchange, and often directly affected by bad weather in the coastal zone; fisheries resources in the region are remarkably reduced while there is 99% of fishers depending on coastal fisheries resources. That's why life of the fishermen is suffering and no chance to develop compared to other villages and communes in the same district.

Measures to implement coastal resources, especially fisheries resources in the area are mainly based on the provisions of State law and carried out mainly through management activities of specialized agencies with low effectiveness. Building a model of co-management, community-based management for coastal areas with high biodiversity such as Thuan An village is really necessary for environmental protection and suitable with actual conditions in the area.

Regular socio-economic monitoring activity in the area will contribute practically and effectively to optimize resource management decisions in the coast.

I. OVERVIEW OF SOCMON IN QUANG NAM

SocMon (Socioeconomic Monitoring) is collection of information on economic and social in coastal areas, to support decision-making process of managing coastal resources effectively.

Coastal residents along with manufacturing operations, their activities are part of the unified system of coast. Any fishery management decisions which may affect human life, lifestyle, and trends of social - economic reflect the impact of fishing for humans and vice versa. Collecting and analyzing of socioeconomic information help to anticipate the situation and scope of affection to have an optimal decision. Thus, collection and analysis of data on economic factors, institutional and social are essential for responsible fisheries management. To manage coastal resources, the managers must reconcile the sustainable use of resources and the requirements of food

security, life and income of the community in a certain coastal area. Understanding the specific institutional, economic, cultural, social as well as the conditions of individual households, social groups, and community organizations will assist coastal managers to optimize their management decisions.

SOCMON SEA - socioeconomic monitoring guidelines for coastal resources managers in Southeast Asia provides theoretical framework and methodology to design SOCMON program in the detail context of each locality. Therefore, this tool can support the decision making process of coastal resource management in Vietnam and Cambodia at the grassroots level, however, it also works at the regional level if related departments share the lessons learnt together, contribute to the common repository of information and may help other departments to understand and use SOCMON.

Tam Hai, Nui Thanh district, Quang Nam Province is one of the four areas were selected to implement initiatives of coastal resources protection at the regional level under the SOCMON for community based coastal resources management program in Vietnam and Cambodia proposed by MCD and implemented in Quang Nam by Sub-Department of Capture fisheries and resources protection of Quang Nam.

SocMon working group of Quang Nam was trained on SocMon SEA, including the training of trainers and running of trial SOCMON at the project areas. They are contributing data to the database and global SocMon and sharing results and lessons learned in the last phase of the project. Hopefully under the activities program of SocMon SEA, cooperation and coordination on issues related to protecting coastal resources between organizations are remained after the project ends.

Tam Hai is a coastal commune of Nui Thanh district, located south of Quang Nam, far from Da Nang city 100 kilometers; east and north near the sea; west and south near Truong Giang River an An Hoa estuary, located in Chu Lai Open Economic Zone, near Ky Ha Port. Tam Hai includes 07 villages, of which, Thuan An village directly adjacent the sea and two estuaries named An Hoa and Cua Lo. It also has the ecosystem of coastal wetlands, estuaries and coral reefs; diverse fisheries resources. However, Tam Hai is directly affected by industrial activities and services of the surrounding area. With an area of about 1.2 km² and 432 households, conomic activities of people in the village associate to marine resources, most of the households participating in fishing in coastal waters, coral reefs. The Village has characteristics of resources exploitation and using activities and management of coastal resources in Quang Nam.

SOCMON working group in Quang Nam

- Sub-Department of Capture fisheries and resources protection of Quang Nam is a partner of MCD, directly implementing SOCMON activities in Quang Nam. Survey area was chosen as Thuan An village, Tam Hai Commune, Nui Thanh district.

- Program Coordinator: Nguyen Van Gioi - Head of Sub- Department

- Working Group:

1. Tran Quang Kien - Fishing Engineer - Deputy Head of Sub Department
2. Nguyen Dinh Toan - Fisheries Mechanical Engineer - officer of Sub-Department
3. Nguyen Thi Kieu Oanh - Bachelor of biology - officer of Sub-Department
4. Nguyen Huynh Nam - Fishing Engineer- officer of Sub-Department

- Survey group:

01.	Vu Cong Bo	Officer in charge of fisheries in Tam Hai commune
02.	Le Van Minh	Thuan An village chiefs
03.	Pham Thi Thu	Deputy Head of Women's union
04.	Tran Nhiem	Thuan An village
05.	Tran Minh Tap	Thuan An village
06.	Nguyen Thi Kim Oanh	officer of Social Propaganda of Tam Hai commune
07.	Bui Thi Tram Anh	officer of commune People's Committee
08.	Bach Thi Hoai	officer of commune People's Committee
09.	Tran Canh Ta	officer of commune People's Committee
10	Bach Ngoc Thanh	Thuan An village

Objective assessment

1. To find out the real situation and the effects of human activities on coastal fisheries resources in the study area.
2. To assess dependence on coastal fisheries resources of the people in the area.
3. To find out people's perceptions about the role of resources protection to community life.

The process of investigation



Training SOCMON for working group members

Time	Location	Activities
Date 28/11/2009	Thuan An - Tam Hai	- Provide training SOCMON for all of working group members - Interview 05 key informants.
29/11/2009 to 01/12/2009	Thuan An - Tam Hai	Interview 199 households randomly selected in Thuan An

II. RESEARCH HISTORY IN AREA

Tam Hai, Nui Thanh district, Quang Nam is a coastal commune of fishing, one side adjacent to the sea, the surface remaining covered by the Truong Giang River with 2 estuaries named An Hoa and Cua Lo. It includes coastal wetland ecosystem and marine ecosystems with many coral reefs, high potential to development exploitation of marine resource products, tourism services, and aquaculture. Thuan An is adjacent to the sea and estuary, most people in village do fishing, their life associated with the sea as well as subject directly affected by natural conditions of the coastline.

In recent years, with different purposes, many agencies and organizations have conducted surveys and research area. However, most studies focus on biological aspects of coastal ecosystems. These include the study as follows:

- Subject: Investigate, survey ecological characteristics and environmental science as a scientific basis for sustainable development of some special species of coastal areas of Quang Nam province.

- + Implementation period: from April, 1999 to December, 2000.

+ Presiding agency: Department of Science - Technology and Environment of Quang Nam.

- Subject: Survey, evaluate and propose solutions to protect and restore wetland ecosystem of coastal Quang Nam.

+ Implementation period: 2007-2009.

+ Agency: Department of Agriculture and Rural Development of Quang Nam.

- Subject: Research on coral cultivation under project integrated management in coastal Quang Nam and Nha Trang Institute of Oceanography in 2007.

- Project Support to build a coral reef protected areas by MCD in Tam Hai in 2005.

According to the results of studies evaluating the specialized management agencies (Sub-Department of Capture fisheries and resources protection of Quang Nam), through reports and evaluation of previous research projects as well as SOCMON data collected at the local, if possible some assessment as follows:

Thuan An - Tam Hai commune - Nui Thanh district covers about 1.2 km², with 432 households, 1582 people, living mainly rely on income from fishing, most are concentrated the fishing in the area of coral reefs and coastal areas. Thuan An is 04 km long coastline, mainly cliffs, is located in An Hoa (Ban Than).



View of Ban Than

The reefs in Ban Than, Dua Reef, Can reef are high biodiversity of Quang Nam province. According to investigation results, there are 225 species and 35 of their 96 varieties, including many species of high economic and export. Number of species recorded is more than in Cu Lao Cham Island, which has been to be a Marine protected area. It has identified 41 species of 25 varieties of seaweed, 15 families, 3 branches, including 07 species with high economic value; 02 in 04 species of lobster have high economic value and distribution in the central coast; many species of echinoderms, crustaceans, mollusks, such as king crabs, snails, pearl, etc.

However, due to the pressure of economic development in the region, increasing in population and economic activities of coastal community, for many years, coral reefs

are facing threatened devastation. That is the over exploitation, lack of control, even using destructive fishing tools electric shocks, poisons; exploitation of immature fish species, especially seed exploitation and other species eggs in pregnancy ... Besides, the economic activities taking place in a dynamic region with less attention to the protection of biodiversity, such as port construction, infrastructure, dredge channels, etc. Along with natural disasters, the Cua Lo beach erosion and large flooding are also the main reason causing death, reducing coverage of the reefs - an animal species is extremely sensitive to light and the sediment deposited on its surface.

Coral reefs are increasingly declining, biodiversity, marine environment degradation, fisheries resources are gradually depleted, life of local fishermen severely affected. If coral reefs are protected, recovered, degradation speed will be limited, biodiversity will be gradually recovered and developed, marine resources and people living become stable and improve from natural resources exploitation rationally and benefits from ecotourism.

Coral reef and biodiversity attached to the life of the people in Tam Hai in general and Thuan An in particular for many years. They have important implications in people's activities. So, against unreasonable impacts mentioned above, the protection, restoration and development of these ecosystems has becoming urgent.

There is no overall planning as well as programs and investment projects for the management, protection and restore coral reef ecosystems in this area. Some topics just stop at the investigation, research on biological aspects of marine ecosystems, fisheries resources, propose solutions, including propaganda and raising awareness, organize to inspect, control and handling of violations in accordance with law. However, these solutions usually be done by only State agency without compromise between needs of ensuring a stable life and income of fishermen in the short term and benefits of the community in the long term. Therefore, management of coastal resources is not effective.

III. METHODOLOGY

Based on management objectives of the Sub-Department for coastal areas in general, coastal village of Thuan An, Tam Hai in particular, three basic assessment objectives are identified including:

- Assess of the status and effects of human impact on coastal fisheries resources in the study area.

- Assess dependency and level of dependency on the fisheries resources of coastal fishing communities.

- Awareness of people about the role of protecting the fisheries resources for community life.

From these objectives, according to guideline of socio-economic monitoring for coastal management in Southeast Asia (SEA SocMon), Quang Nam SOCMON group has selected 32 indicators.

The group studied documents on specialized management at the Sub-Department, combined with information collected through meeting with leaders of Tam Hai commune People's Committee, annual reports of socio-economic situation, commune's plans and programs, etc. to form set of primary data, as basis for planning of socio-economic monitoring in the area should be studied.

Collecting secondary data was conducted through household surveys and key informant interview. We use questionnaires including indicators. A working group of 10 local officials were trained theory of SOCMON and how to conduct a SOCMON in the field.

Using statistical probability, based on the scale of subject to investigation, number of samples selected is 199 samples for household survey and selected 05 key informants who are knowledgeable deeply engaged in production, business, economic status, social status and resource management research in the area.

The investigator arranged an interview households located in all area of of Thuan An.

Collected data is encrypted and built on a database on electronic files of Excel software. It was queried, processed and analyzed via tables.

IV. RESULTS

Synthesized results of data on the socio-economic indicators are shown in the Appendix of the Report. Through analyzing of survey data, based on objective assessment, some



conclusions about social and economic conditions in the project area outlined as follows:

Thuan An - Tam Hai is located east of Tam Hai, directly adjacent to the sea and the seaport of An Hoa, Cua Lo (see map of study area), land area of approximately 1,2km² with 432 households and 1582 inhabitants.

Fishing activities in coastal zone, concentrating in the areas of coral reefs such as Pan Than, Dua reef, Can reef, An Hoa Bay, is the main occupation of local communities.

Products derived from fishing primarily for consumption, food for themselves.

Transportation, services for daily life and production of fishermen are difficult.

Education level of villagers is lower than common level of people in commune or district (16.1% people at education level of primary, 70.9% secondary and only 12.1% high school and higher).

Scale of production is small, at household level, capacity of boats is low, fishing gears are simple and handicraft, fishing yields is also low. Service activities in areas related to coastal resource use virtually undeveloped. However, due to special natural conditions and geographical location, coastal zone of Thuan An is heavily influenced by industrial or service activities from outside, for example exploitation of Ky Ha seaport, developing Chu Lai open economic zone, dredging channels of Truong Giang River, activities of ships, fishing by fishermen from the surroundings. Besides, the production activities of the Thuan An community also created great pressure on coastal resources in Thuan An, such as over fishing, destructive fishing such as using electric shocks, explosives, collecting lobster in their breeding season, exploiting coral, fishing with trawl nets in near shore.

According to statistic from collected data, up to 100% of households in Thuan An response that they involve in fishing, although they may participate in other occupations like aquaculture, others (2%). Their main income also is from fishing. 67.3% of households with income from fishing accounts for 100% of family income, and predominantly low-income, less than 3 million per month. Life of community depend heavily on fisheries resources in coastal area of An Hoa, Ban Than. They still remain traditional fishing in area near the residence (up to 99% answers confirmed that). In addition, they get troubles with capital and low income, so they cannot accumulate or re-invest (according to the Commune People's Committee, 80.1% of total households are poor or just have enough food to eat). Their ability of accessing to new exploitation

technologies is limited. For all of reasons, their dependency on resources is increasing more. There are almost none of opportunities for development of service activities related to coastal resources such as tourism.

Status of fisheries resources, particularly coral reef ecosystem in Ban Than, Dua Reef, Can Reef (belonging to coastal zone of Tam Hai), are declining seriously (as reported in research on Survey, assess and propose solutions to protect and restore wetland ecosystem of coastal Quang Nam: coverage of hard coral in Southeastern coastal of Dua Island, at the HD-1 point, coral coverage reached 50-60% and mainly coral blocks. At HD - 2, hard coral coverage is only around 25-30% , in north-eastern coastal areas, outside the entrance lagoon, coral coverage of only about 25-30%, in the shallow front yards and the An Hoa awkward Large Coral Beach, the average level of about 10-15 %). For fishers in Thuan An, status of coral reef ecosystem was recognized similar. 76.88% of respondents think that fisheries resources now are fewer than 10 years ago while 19.6% believed that resources are getting exhausted.

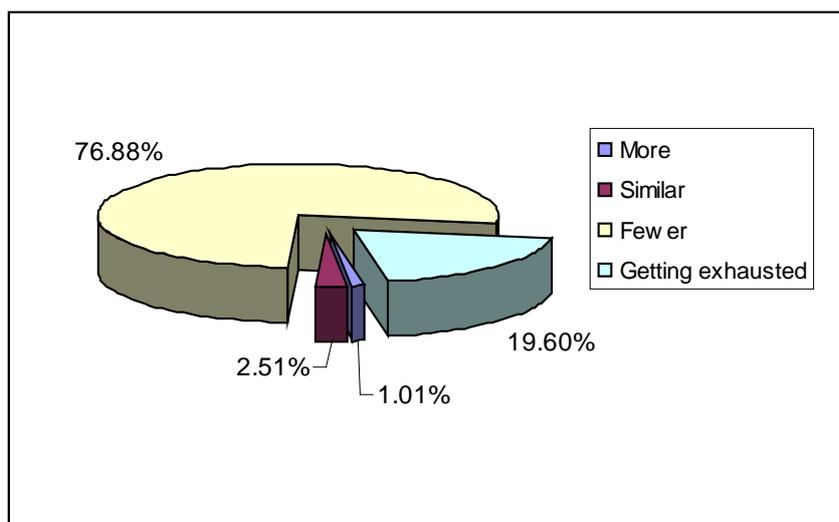


Chart 1. Community's comparison of fisheries resources at current time & 10 years ago

However, evaluating the status of coral reefs and sea grass here, the answer is very bad (7.5%), bad (35.2%), not good not bad (31.7%), good (19.5%).

In spite of unqualified scientific information, that community's awareness about the status of fisheries resources, coral reefs in area are not good and tends to decrease also reflects the real situation, because they have a long time working on the sea.

The SocMon group also studied awareness of community on threats to marine resources in general, aquatic resources in particular, namely risk of depletion of coastal fisheries resources. As a results, 170/199 (up 85.4%) answers are over exploitation, 111/199 (55.8%) answers are destructive fishing (electric shocks, explosives), 167/199 (83.9%) answers are because of environmental pollution (activities of seaport, ship, dredging canals, etc.).

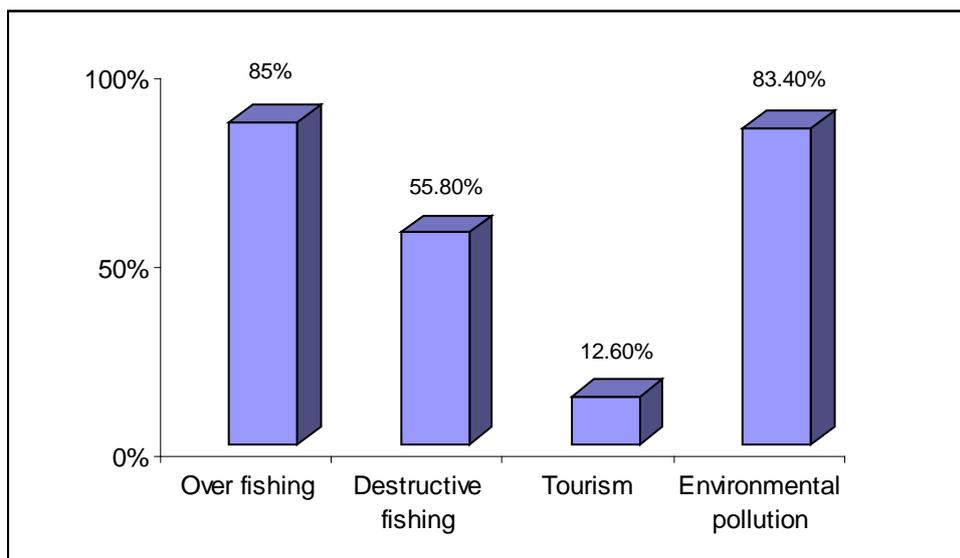


Chart 2- perspective of Thuan An villagers on threats leading to coastal fisheries resources

Results from wetland coastal of Quang Nam project are determined the cause of coral reefs decreasing, which are due to indiscriminate exploitation, declining environmental quality, increasing waste water and sediment from many different economic activities such as infrastructure construction, dredge canals, unreasonable fishing; especially destruction of wetland ecosystems along the rivers, lagoons, estuaries which has lost useful buffer system for the marine ecosystem. Coastal resources are increasingly depleted due to irrational exploitation and increase the intensity of exploitation of coastal areas, even using destructive methods such as using explosives, electric shocks, poisons to do fishing.

There are 126/199 of people participated in training course or advocacy events on legal provisions of protecting and developing fisheries resources delivered by the functional organizations. This number expresses great interest of community for the protection of fisheries resources and marine resources in the locality. Especially, they are very aware of legal provisions on the protection of aquatic resources (194/199 responses, accounting for 97.5%), in particular prohibited fishing activities such as using explosives, electric shocks, chemical, over fishing inshore, exploiting coral and lobsters in the period from April 1 to July 31, exploitation endangered aquatic species.

Although villagers are aware of the risks, threats or causes to depletion fisheries resources, laws and regulations on prohibition of certain fishing as well as long term benefits of fisheries resource protection, level of support and ready to implement legal provisions on this sector is not high. According to statistical data results, only 156/199 (up 78.4%) have concurred to the question "Do you concur or not if inshore drift-net is prohibited?".

Compliance with laws and regulations of the fishermen in practice has distance longer than their perception. According to assessment of the People's Committee of Tam Hai, violations on fisheries resources protection, especially lobster exploitation in prohibited time and proportion from 20-50% in the number of fishermen engaged in fishing. In addition, according to the report of the fisheries inspector of Quang Nam most recently in 2009, they have been detected and handled 07 cases of exploitation of lobster (with 70 live lobsters) in Ban Than, Tam Hai in the period from 01/4/2009 to 31/7/2009 within only 04 times of patrol.

V. DISCUSSION

The scale of the survey is not large but within the scope of research, SOCMON working group of Quang Nam has established a set of data, basic information on economic situation in Thuan An village. The survey data reflects the natural conditions of the study area both on land and at sea, the production area of the fishing community, living and production conditions of fishermen, status of coastal resources, as well as the dependency of communities on resources. Data also reflects the community's awareness about marine resources; the threats might lead to resource depletion, sense of protection and development of coastal fisheries resources. This information has important meaning, along with biological data to add to assessment of coastal resources using, as well as propose solutions to manage resources more effectively.

Through analysis of survey data, we find that life of fishermen in Thuan An associate with marine and coastal environment. Level of dependency on coastal fisheries resources is enormous. Statistical results showed that 100% of households involve in fishing and 67.3% of which is the main income from fishing. At the same time, fishing is traditional occupation of community but it is not development. From these factors, we can see that marine resources was under big pressure from daily fishing activities of fishermen in the village, however, fishing bring them basic conditions for ensuring their life. Thus, the adjustment of relationships between communities and coastal resources protection, towards compromise between immediate and long term interests is

essential. It will be difficult and challenge for the management as well as for local villagers.

Many biological researches in the area have reported about the status of depleted resources, resources are declining and the trend continued. Fishing communities in the region also recognize this situation via their daily fishing activities. They also identify the threats, causes of decline but no efforts or actions from the community to improve this situation. It is result from their economic circumstances difficulties, low income and heavy dependency on fisheries resources which they exploited every day.

The concept of community-based resource management or co-management is no stranger to the managers now. However, applying this approach in the real still has problems and difficulties. Although community was aware of good goals of resources co-management is to bring a long-term benefit for themselves and their generations in the future, but the readiness level of community to involve in management model has not really high. Statistical results show low consensus for this solution, only 68.8% of respondents answered that it should be assigned some area including coral reef for local fishermen so they can manage and protect resources themselves. Besides, the opinions of the responsible people in the community also express a desire not to conduct this model at that time.

While the community is not acutely aware of the content management in which the role of the community initiative for the implementation of self-management goals as determinants of success of the model, then the end pressing needs of daily life such as employment and income become a top concern of the community is objective reality should be noticed and really interested. The conflict between the immediate interests with long-term benefits that the subject is moving toward, even those most enthusiastic about the subject the idea of building model protection, conservation is always a great difficulty for implementation of management plans. Conversion professional organizations for a rational exploitation of its members directly benefit from catching aquatic resources are common solutions to reduce pressure on coastal areas but create livelihoods, income supplements, alternative for community participation in co-management is a key factor to ensure survival and model development. Support from outside will provide opportunities for community out from circle of poverty, low income and resource depletion of marine resources.

VI. CONCLUSION AND RECOMMENDATIONS

Life of fishing communities in Thuan An - Tam Hai associated to the marine and coastal resources. Interaction between nature and humans demonstrate very clearly here, reflected through the socio-economic characteristics of the area. Natural conditions, inconvenient geographical location to transportation and information exchange, and often directly affected by bad climate events in coastal area; fisheries resources in the area are increasingly reduced, making life of fishermen difficult and has no chance to develop compared to other villages and communes in the area.

Marine ecosystem in the research area is where biodiversity high in central Quang Nam province. Ban Than reef, Dua reef, Can Reef are habitats of many rare species and highly economic value and also the place where everyday fishermen do fishing to earn main income for their family. The protection, restoration, regeneration of ecosystems of this area has great significance in the protection of ecological environment as well as the development of fishing communities in the region in a sustainable way. Formation of a management model of marine resources, protection of fisheries resources with the participation of communities is an effective solution to solve both the protection and conservation of fisheries resources both stability and development regional economic and social. Of course, the plan by building a model of community effort and support from stakeholders must be considered a whole.

SOCMON has practical significance for management activities, especially in coastal resource management. The collected information on socio-economic in certain areas will be used by managers to optimize their management decisions. Information reflects the awareness and knowledge of community on status of resources as well as natural resource management activities, institutions and laws will help managers predict the practicability of decisions. This is also the basis for the appropriate solution, effective management strategies for coastal communities who are considered the most important factor.

However, monitoring activities must be periodically repeated to create the new sequence data to compare and evaluate changes in the general condition of the subjects of management. The proposed objectives for appraising the management objectives and selection criteria appropriate observation, and questionnaires built with deep content, new structure creates strong results of data accurately reflect the real situation, especially the question of perception.

SOCMON working group just conducted SOCMON in a small area but preparatory works for the survey was done very carefully from training, training investigators, planning,

etc. , therefore the group achieved very positive results. The survey data can be used for research, resource management, coastal fisheries resources, and supplementary information for research reports on this area before. The maintenance of regular SOCMON activity will contribute to make practical and significant decisions, improving effectiveness of coastal management in the area.

Appendix 4

**Socio-economic Monitoring of Coral Reef
in My Hiep village, Thanh Hai commune, Ninh Hai
district, Ninh Thuan province**

An Assessment Report

Submitted to: MCD

Date of submission: March 30, 2010

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ABSTRACT

Objectives of the report

My Hiep village in particular and Ninh Hai district, Ninh Thuan province in general has advantage geographical location with many coral reefs. Coral reefs are home of marine species, providing for local people source of rich aquatic food every year such as grouper, squid and lobster. In addition, coral reefs can reduce power of wave or erosion and then protect coastal fishing villages.

However, due to community's insufficient awareness of the importance of coral reefs for their own life, corals are not protected by them. A number of people even involved in the exploitation of coral. Coastal landslide, depletion of fisheries resources are evidences of the decline in coral resources at an alarming rate.

Usually coastal resource management just focuses on natural resources management. Marine reserves and other conservation initiatives have trend to focus on managing physical or biological aspects such as recovery of species, habitats, biodiversity, etc. However, it is recognized that projects on the management of marine resources play an importance role to the socio-economic development of neighboring communities.

The overall project goal is to strengthen the management of coastal resources in Vietnam and Cambodia.

Specific management objective in My Hiep (Thanh Hai - Ninh Hai - Ninh Thuan) is that community participates in coral reef management.

Summary of findings

- My Hiep village has an area of 30 ha with a total of 168 households and 762 populations, in which female accounting for 51.97% of total population.
- 119 households were interviewed, accounting for 70.83% of total households
- 100% of respondents are educated at the level of primary.
- The key income sources of respondents are listed respectively as: fishing accounting for 74.8%; agriculture accounting for 16.8% and small trade accounting for 8.4%.
- 67% of respondents have fishing vessels for fishery exploitation.
- 100% of respondents do inshore fishing during the whole year.
- 93.2% of respondents know about the banned fishing activities.
- 100% do not violate the law or regulations on fisheries
- 89.9% of respondents have not involved in any community group yet.

Summary of conclusions

According to findings above, we can see high dependency of villagers on coastal and marine activities. Awareness of people in observance of fisheries provisions and regulations is still low, violations are still remained. Besides, planning has been not reasonable lead to conflicts of interests among sectors or shortage of jobs, etc.

Applying SocMon will provide us an overview so easy to analysis and assess the natural conditions, environment and socio-economic of the village. Base on those results, we can recommend some livelihoods as well as effective coastal resource management in the future.

It should have policies to manage coral reef sustainably, striving to establish coral reef protected area; concurrently, find other alternative livelihoods for coastal fishing households.

I. OVERVIEW OF SOCMON IN NINH THUAN

1 / Concept of socio-economic monitoring:

Socioeconomic monitoring guidelines for coastal managers in Southeast Asia (SOCMON SEA) gives a set of simple and standardized guidelines for socioeconomic monitoring at a coastal management site in Southeast Asia.

This guideline also provides a list of most useful socioeconomic indicators for coastal management as well as the questions necessary for data collection.

2 / Content of SocMon project in Ninh Thuan

17 months working:

- Select a core group of 05 people who will be trained with SocMon Sea

- 01 training for local staff and people at commune or village level on methods of gathering data processing and organized by core group members who trained in SocMon Sea.

- 01 survey to collect data applying SOCMON indicators chose by the core group.

- 01 assessment report has been developed

3 / Information on SocMon survey area:

General Description:

My Hiep village - Thanh Hai - Ninh Hai - Ninh Thuan

- Area: about 30 ha

- Population: 168 households (762 inhabitants)



Training on SOCMON for local staff and people in Thanh Hai commune

- Low educational level, there is 01 kindergarten in the village
- Occupation: fishing, aquaculture, agriculture, services, seafood processing and others.
- Fishing occurs mainly in near shore, fishing gears are small boats or motor boat.

Through a combination of research material, coral ecosystem in My Hiep in particular, and Thanh Hai, Ninh Hai - Ninh Thuan in general include genus of coral blocks *Goniastrea*, *Porites*, etc. Coral reef cannot be higher due to low tides, so they growth only in horizontal; thickness of this mass death coral ranged from 1.2 to 1.5 m , the width of the mass is 120-210m.

coral reefs is a ramp, at this place seaweed species appear and they form a band of seaweed. Deeper than the ramp is a background with flat terrain where reef-building coral species appear. In addition to the typical type of reef above, coastal area in Ninh Hai - Ninh Thuan also find non-reef-building coral. This collection of corals living on the rock including mass coral (*Goniastrea*, *Merulina*, *Porites*, etc.) and stem coral (*Acopora*, *Pocillopora*). They are very small and stick directly into the rock. The most important reef-building coral is in the north of province from Hon Deo to Hon Chong (about 2.8 km long), width of the reef 120-210m, above the Hon Chong nearly 300. Reef-building coral in coastal Ninh Hai - Ninh Thuan has coastal typical form, creating a specific ecosystem.

Species composition on reefs in Ninh Hai district is relative abundance and diversity:

- Corals: 334 species including: 59 varieties of hard coral, 16 species of soft corals, 6 species of horny corals, 3 species of hydra coral.
- Coral reef fish: 173 species of 82 genus and 33 families. Fish families have abundant umber of species as Labridae: 30 species; Pomacentridae: 24 species; Chaetodontidae: 18 species, etc.
- Seaweed: 188 species of 04 branches, 86 and 32 families. Rhodophyta has the most abundant species number (79 species).
- Crustacean: 80 species of 53 genus, 20 families and 5 orders ...

(source: Project Pilot Model of community participation to protect the reef resources Ninh Hai - Ninh Thuan, project director: Pham Trung Kien)

3 / Objective assessment

SOCMON is conducted in My Hiep to assess:

- The participation of communities in coral reef management
 - Awareness of people about the importance of the Coral Reef
 - The benefits of people in coral reef management
 - The situation of fishing activities on the Coral Reef
 - Cooperation between the villagers with authorities involved in the settlement of violations

4 / Time and methods

- Time: October 03 - 12, 2009

- Methodology was built basing on SOCMON SEA.

II. RESEARCH HISTORY IN AREA

My Hiep village plays a very important role in marine conservation. This marine area has 15ha with two major ecosystems such as sea grass beds and coral reefs.

With the support of ICRAN and WWF, conservation activities have been developed, such as develop program of awareness rising for local communities, and establish volunteer team to protect coral reefs and sea grass.



Beach in My Hiep village

Besides, Ninh Thuan Department of Science and Technology and Sub-department of exploitation and protection of fisheries resources supported for 2 training courses on monitoring and evaluation of the MPA in 2006 and 2007 for staff of village management board and the local community provided by Nha Trang Institute of Ocean. Each training course was in seven days, including 3 days for theory and 4 days for practice in the field. However, after those trainings, there are almost no activities from trainees applying knowledge that they have learned.

III. METHODOLOGY

Information on natural conditions and environment were assessed through inheritance, analysis and synthesis of secondary information from previous studies.

* Select samples (questionnaire)

Key informant: 03 samples

- Households survey: 119 samples

SOCMON was conducted from October 3 to 12 in 2009 at My Hiep village, Thanh Hai - Ninh Hai.

Before conducting the survey, were trained programs and contents of the survey. The survey was carried out by four steps:

- Step 1: Hold a number of consultative meetings with the commune officials, village and related villagers.

- Step 2: Work in the village. Training course in My Hiep for staff of commune and village and villagers on methods of collecting and processing data was held by the core group members.

- Step 3: Organize field data collection (secondary, primary) by questionnaires and key informant interview.

- Step 4: All information obtained from the field will be analyzed and processed to assess the status of natural conditions and environment, the economy of village, from which suggest some solutions of management for village as well as coastal resources management in the future.

IV. RESULTS

SECTION A: KEY INFORMATION INTERVIEW & SECONDARY DATA

1 / General information about the socioeconomic situation of My Hiep

According to officials of Commune People’s Committee: the total number of households in My hiep is 68 households with 762 inhabitants, of which the male is 366 people, accounting for 48.03% and female is 396 people, accounting for 51.97%.

* The age of workers: 450 people in working age, including 245 women (accounting for 54.4%) and 205 men (accounting for 45.6%).

Currently, village has kindergartens and primary school. Local children must move to other place to learn secondary school, and move to town of Ninh Hai district for high school. Percentage of people with primary educational level accounts for more than three quarters while the percentage of secondary and high school is very small.

Almost no household in My Hiep have house with more than one floor. Tiled roof houses occupied only a very small proportion of about 14%, the rest are thatched roof houses.

Table: Percentage of households by type of houses in the village

<i>House type</i>					<i>Communications</i>	
<i>Upstairs</i>	<i>House wall tiles</i>	<i>Walled house roof</i>	<i>Wind House</i>	<i>Other</i>	<i>Mobile</i>	<i>Desk phone</i>
0%	14%	0%	86%	0%	33%	14%

2. Economic situation

Main occupations of local community include: fishing, aquaculture, agriculture and trade.

2.1. Fishing and aquaculture

Fishing activities here are quite diverse. Gill nets, purse seine, diving mainly occur in local sea area, about 1-3 km from shore. Fishes catch commonly are yellow leatherjacket, yellowtail scad, anchovy, tuna, little lobster, squid, cobia and other kinds of fish. They live outside of protected area and other places not belonging to village. Some households are contributing capital together to buy offshore fishing boats. Currently, the village has 49 small fishing boats.

In regards to aquaculture, villagers mainly involve in raising breeding tiger prawn, but the owner of breeding shrimp farms are not local villagers. They are from Phan Rang Thap Cham City or other province. Therefore, shrimp rising should not affect the economic of My Hiep villagers. Formerly, with the support of the Extension Center and Sub-Department of Fisheries Resource Protection under old Department of Fisheries Ninh Thuan, seaweed farming program are also developed.

Table: Types of fishing and fishing seasons of My Hiep villagers

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
Gill net	x	x	x	x	x	x	x	x	x	x	x	x
Diving	x	x	x	x	x	x	x	x	x	x	x	x
Purse seine	x	x	x	x	x	x	x	x	x	x	x	x

2.2. Agriculture

At My Hiep, almost all households have no land for agricultural development, especially land for cultivation. Currently, there are only about 20 agriculture households, of which only 1-2 households cultivating. Some households raise pigs with small amount because of lack of land and water.

2.3. Trade

Trade activities here are mainly fisheries trade. Traders buy fish exploited by the fishermen in the village and sell at local markets. In addition, there are about 10 households involving in grocery trading services.

2.4 Fisheries resources protection

Coastal area of My Hiep village has an area of about 15ha with two major ecosystems sea grass and coral reefs. With the support of organizations such as Icran, Department of Science and Technology, Sub- Department of Fisheries Resource Protection, conservation activities have been developed, such as develop program of awareness rising for local communities, and establish volunteer team to protect coral reefs and sea grass.

3. Stakeholders

The activities in marine and coastal areas mainly focus on the following activities: fishing, aquaculture, construction, residential development. Depending on which specific activities, different stakeholders involve as public, fishermen, aquaculturist, traders, consumers, commune people's Committee staff, village Management Board.

SECTION B: HOUSEHOLD INTERVIEW

1 / Demographics

During SOCMON in My Hiep from 10.03 - 12.10.2009, working group interviewed 119 households out of 168 of all households. The total number of inhabitants of 119 households is 581 people, ncluding 316 men accounting for 54.4% and 265 women accounting for 45.6%. Number of person in a household is:

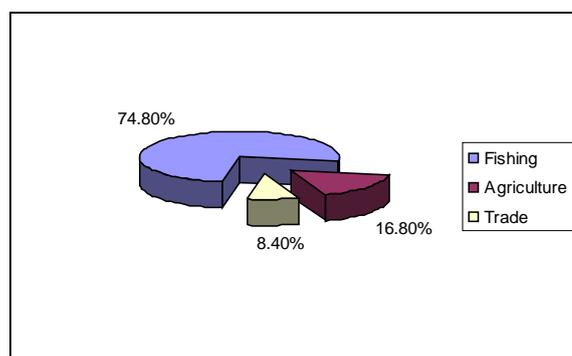
Inhabitants	Number of households	Percentage
2	6	5.0%
3	10	8.4%
4	33	27.7%
5	29	24.4%
6	28	25.5%
7	10	8.4%
8	3	2.6%
Total	119	100%

Previously, with no electricity and no schools, educational conditions of the people were very difficult so their educational level is very low. Currently, with improved infrastructure, their educational level is increasing a little bit. Among the 119 respondents were educated at primary level.

2 / Household income

- Sources of household income are mainly from fishing, agriculture and trade. Specifically as follows:

Main source of income	Number of households	Rate
Fishing	89	74.8%
Agriculture	20	16.8%
	10	8.4%
Total	119	100%



-Household income is divided into groups as following table (Unit: VND/month):

Living standards	Number of households	Rate
Households with incomes of less than 2 million	2	1.7%
Households with incomes from 2 to 3 million	38	32%
Households with incomes from 3 to 4 million	32	26.9%
Households with incomes over 4 million	47	39.4%

Total	119	100%
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3/ Marine and coastal activities

Main marine and coastal activity of fishing communities in My Hiep is fishing. They capture in inshore area, year-round crop, including types of fishing such as fishing with hook and line, purse seine, gill net, diving, etc. very diverse including almost all fishes can be consumed such as shrimp, fish, squid, etc. All products are sold in local markets. See detail in the table below (*results synthesized from 89/119 fishing and aquaculture households*).

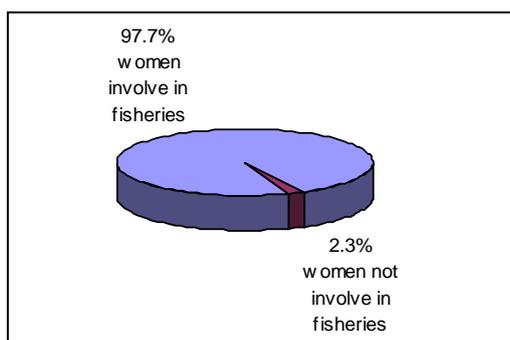
Using fishing boats or not	number of respondents
Yes	80
No	9

Mainly fishing products	Number of respondents	Notes
yellow leatherjacket, yellowtail scad, anchovy, tuna	44	- Coastal fishing grounds: 89/89, 100% - Fishing season: year-round: 89/89 100%
Little lobster	36	
cuttle fish	33	
Cobia	33	
Grouper	4	
Others(ca chang, ca mo, rua, ca la)	40	

Highly economic fish products	Number of respondents
yellow leatherjacket, yellowtail scad, anchovy, tuna	44
Little lobster	3
cuttle fish	30
Cobia	36
Grouper	32
Others(ca chang, ca mo, rua, ca la)	36

Main fishing gears	Number of respondents
Seine	42
Gill net	50
Diving	23

In terms of participant of women in fisheries activities, 97.7% of respondents say that women involve in fisheries activities. It can be see that women also play an important role in fisheries compared to men.



4 / Perceptions and perspectives

4.1 / Fishermen's perceptions of prohibited types in fishing

Mostly fishermen know about prohibited types in fishing. Details in the following table:

Prohibited types in fishing	Number of respondents	Rate
Know	83	93.2%
Do not know	6	6.8%

4.2 Awareness of prohibited activities:

Understanding of prohibited activities	Number of people who have understanding
Using explosives	83
Pulse seine	25
	39
Exploit coral and sea turtles	31

4.3 Situation of fisheries violations:

Violations	Number of respondents	Rate
Yes	0	0%
No	89	100%

Looking at this table, we can generalize about people's awareness of these issues as follows: they have understanding about a number of prohibited activities (explosives, electric shock, poisons, corals and sea turtle exploiting) so other violations such as making pollution, using fishing net on coral reefs, collect fish with incorrect size or incorrect season, etc. so they do not recognized as violations.

4.4 / Participation of people in the community group

There are only over 10% of respondents involve in community group.

Participation of people in the community group	Number of respondents	Rate
No	80	89.9%

Yes	9	10.1%
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V. DISCUSSION

From SOCMON survey results in My Hiep village, we can show highlights as follows:

- Current population: 168 households with 762 inhabitants (average is 4.5 inhabitants per household)
- Gender ratio: 366 male accounting for 48.03% and 396 female accounting for 51.97%.
- Educational level: Percentage of people with primary educational level accounts for more than three quarters while the percentage of secondary and high school is very small.
- Sources of income: fishing accounting for 74.8%, agricultural: 16.8%; trade: 8.4%.
- Household income: number of households with less than 2 million per month accounting for 1.7%; from 2 to 3 million: 32%; from 3 to 4 million: 26.9%, and over 4 million: 39.4%.
- Types of fishing: purse seine, gill nets, diving
- Fishing grounds: in coastal area
- Fishing season: year round
- Number of women interviewed engaging in fishery activities is 87/89 accounting for 97.7%.
- Awareness of fishermen on prohibited activities
- + Awareness of fishermen on prohibited types of fishing: most of interviewers know about this:

Prohibited types in fishing	Number of respondents	Rate
Know	83	93.2%
Do not know	6	6.8%

- + Awareness of prohibited activities

Understanding of prohibited activities	Number of people who have understanding
Using explosives	83
Pulse	25
	39
Exploit coral and sea turtles	31

- + The situation of fisheries violations:

Violations	Number of respondents	Rate
------------	-----------------------	------

Yes	0	0%
No	89	100%

From the table above tells us that people have understanding about a number of prohibited activities (explosives, electric shock, poisons, corals and sea turtle exploiting) so other true violations do not recognized as violations by them.

- Participation of people in the community group

Participation of people in the community group	Number of respondents	Rate
No	80	89.9%
Yes	9	10.1%

Information collected during SOCMON in My Hiep has shown the advantages of methods used in SocMon. It's easy to grasp an overview of the socio-economic situation in the locality. provide solutions and plans for socio-economic management in general and coastal zone management in particular.

VI. CONCLUSIONS AND RECOMMENDATIONS

From SOCMON results, we can see the dependency of local people in My Hiep on marine and coastal activities is very high. Fishing gears has small capacity and fishing ground mainly appear inshore area. Aware of the people in complying with the rules and general principles, protecting fisheries resources and coastal management is low. Leaving waste to the coast, fishing on coral reef, etc. still exist. In addition, planning has been not reasonable lead to conflicts of interests among sectors or shortage of jobs, etc.

Applying SocMon will provide us an overview so easy to analysis and assess the natural conditions, environment and socio-economic of the village. Base on those results, we can recommend some livelihoods as well as effective coastal resource management in the future.

A. SOLUTIONS RECOMMENDED

Recommendations for authorities of Thanh Hai commune, My Hiep village

- Strengthen inspection and strictly handle cases of violations

- Improve propaganda and environmental education, raising awareness for people so they understand the guidelines and policies of the State as well as their responsibility and interests in coastal resources conservation. They will actively involve in all activities to achieve the best results.

- Support and guide for local villagers in the creation and , especially the fishermen to reduce excessive fishing pressure on coastal resources.

- Provide loans to expand livelihood activities or upgrade facilities to conduct offshore fishing.

- Develop tourism to provide more alternative jobs for local people: for example sell seafood for tourists.

- Authorities built sign of banning waste leaving indiscriminately

B. RECOMMENDATIONS

Authorities at state and province level should:

- Plan to use coastal resources - Strengthen the institutional and policy. Policies have to interdisciplinary, avoiding duplicated.

- Provide guidelines on environmental impact assessment to determine overall impact level on a regular basis, thereby making the forecasts, bring measures and technical measures to prevent and mitigate environmental hazards.

- Improve management capacity including manpower, skills and equipment

- Support capital for people in the creation and transformation career through credit channels.

- policies to manage coral reef sustainably, striving to establish coral reef protected area; concurrently, find other alternative livelihoods for coastal fishing households.

Appendix 5

Socio-economic Monitoring of Coral Reef in Xuan Tu 2 village, Van Ninh district, Khanh Hoa province.

An Assessment Report

Submitted to: MCD

Date of submission: 15th May, 2010

Author Team:

Tran Duc Tri

Dang Tri Thong

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Summary

This report was compiled as a key output of program component of SocMon project. The overall goal of this project is to improve the management of coastal resources in Viet Nam and Cambodia through the implementation of integrated coastal management plans that are guided by the results and recommendations of socioeconomic monitoring at four selected sites.

The specific objectives of this study were defined to:

- Assess the awareness of local villagers in Xuan Tu 2 about Trao Reef Marine Ecosystem Protected Area
- Assess the awareness of local villagers in Xuan Tu 2 about the marine environment and fisheries resources
- Identify the effectiveness of existing sustainable livelihood development program

The findings of this study will be used to strengthen the implementation of management plan and identify the interest of local community in Trao Reef MPA.

281 households of Xuan Tu 2 village and 05 key informants were interviewed to provide the information of selected indicators. Some findings are described as below:

- 75% of total households involved in fishery activities.
- Average income of households is 550,000 VND / person / month
- 60% of respondents do fishery activities for a living
- Although the fishery capture is the most occupation used by the respondents (33.57%), the key income source of respondents from aquaculture accounting for the highest proportion (41.45%).
- 71% of respondents answered “Don’t agree” with the question: “Coral reefs are only important if you fish or dive”.
- 75% of respondents answered “Disagreed” with the question: “Seagrass beds have no value to people”.
- About 57% of respondents reported about the “very good” status of coral reef
- About 59% of respondents reported about the “good” status of mangrove
- About 63% of respondents reported about the “normal” status of sea grass
- 100% of respondents were aware of and support Trao Reef Marine Ecosystem Protected Area

- 95% of respondents learnt about the snout otter clam culture model supported by MCD and 75% of respondents recognized their need of access to loans to do this model.

The results demonstrated that the local villagers in Xuan Tu 2 significantly depend on coastal resources. The method being employed by local fishermen is simple, most of fishing vessels are low capacity and active in inshore area. The government regulations of fisheries activities are recognized limitedly by local people, the litter dropping into the sea is still happening. Fishing and aquaculture were identified as two of the most key income generations in the studied site. The income from aquaculture is higher than from the fishing. Trao Reef Marine Ecosystem Protected Area is highly considered by local villagers due to its achievement of fisheries resources protection. More information is required to effectively facilitate a sustainable livelihood development.

1. Overview

1.1 Introduce on SocMon concept

SocMon is a set of guidelines for establishing a socioeconomic monitoring program at a coastal management site in Southeast Asia. The guidelines provide a prioritized list of socioeconomic indicators useful to coastal managers as well as the questions for data collection and the tables for data analysis. It is expected that the guidelines will be tailored to each site's needs. SocMon is a companion to the GCRMN Socioeconomic Manual for Coral Reef Management (GCRMN Manual).

SocMon is intended to:

- Provide a methodology for regularly collecting basic socioeconomic data useful for coastal management at the site level.
- Provide a basis for a regional system by which site-level data can feed into national, regional and international databases for comparison.

1.2 Introduce on SocMon active project

Responding to the dual need to improve coastal resource management in S.E. Asia through targeted management interventions informed by a better socioeconomic understanding of site conditions, as well as the need to develop in country knowledge and expertise in socioeconomic monitoring, this project proposes a Vietnamese-Cambodian partnership to implement SocMon SEA methodology at four project sites. Proposed activities include a SocMon SEA training workshop with a training of trainers component, implementation of pilot socioeconomic monitoring projects at four marine conservation sites, and a convening workshop to share results and lessons learned.

Project objectives are to:

- Develop SocMon SEA expertise among partners sufficient so that these partners can both implement the SocMon methodology on their own as well as instruct others in the SocMon conceptual framework/methodology.
- Organize and implement socioeconomic monitoring pilot exercises at the four proposed project sites in order to better understand the relationship between community/household demographics, coastal/marine activities, governance, attitudes, infrastructure, material style of life, and the status of reef resources at these sites.
- Share data/lessons learned amongst stakeholders and partners in order to improve site specific management programs.

In order to obtain these objectives 04 key stakeholders are involved:

- Quang Nam Department of Fishery Resources Protection and Exploitation
- Management Board of Trao Reef Locally Managed Marine Area

- Ninh Thuan Department of Fishery Resources Protection and Exploitation
Cambodia Fisheries Action Coalition Team

1.3 The survey site

Xuan Tu 2 is a coastal village of Van Hung commune, Van Ninh district, Khanh Hoa province. The village covers 800 ha in area with the total populations of 2,462 people belonging to 553 households. Most occupations used by local villagers are fishing, aquaculture, agriculture and other services.

Trao Reef is a coastal coral reef located in the south of Van Phong bay, Khanh Hoa province, approximately 60 km north of Nha Trang city. Administratively the territory of Van Hung commune covers the whole of Trao Reef which is under intensive pressure from the fishery practices of local communities, especially by villagers in Xuan Tu 1, Xuan Tu 2, Ha Gia and Xuan Vinh.

The baseline data indicates that the reefs in the area are fringe reefs that run along or close to the coastal shoreline. Water depth ranges from 2-3 meters near shore to 6-7 meters towards the outer reef slope. Part of Trao Reef is even exposed at low tide. It has a remaining coral coverage of 40-60% that is dominated by porites and diploastrea.

In Van Hung commune alternative employment options are limited with approximately 70% of the households involved in coastal fisheries. In surveys undertaken prior to the establishment of the marine reserve hard coral cover was estimated at 10-20% - even less than the already low national average. Destructive fishing (dynamite, cyanide, trawling) and unsustainable fishing practices have resulted in decreased fishery harvests, smaller sized fish and commercial extirpation of some species such as abalone, lobster, sea cucumber, grouper, in addition to causing serious damage to reefs and coastal erosion. The situation has been compounded by indiscriminate coastal aquaculture of lobster and black tiger shrimp that is polluting waters, increasing disease levels, and causing social conflict.

With the goal of protecting Trao Reef from overfishing and destructive fishing practices and to rehabilitate the degraded coastal environment, the Centre for Marinelife Conservation and Community Development (MCD) has facilitated the process of establishing a locally managed marine reserve with the local authority and community in Van Hung commune.

2. Methodology

The study has been conducted by following the SocMon SEA guideline and some instructions suggested by the leading trainer of ToT training.

2.1 Key Informant/secondary source

The secondary sources of data such as site description, the previous studies, regulations were considered to collect and assess. Some key stakeholders were willing to provide these information as below:

- Van Ninh district authority
- Van Hung commune authority
- Trao Reef Management Board
- Centre for Marine Life Conservation and Community Development

A list of 05 informants who are the government staffs at district and commune levels has been built, a questionnaire to interview them was also designed in reference to the indicators of SocMon guideline.

2.2 Household survey

A questionnaire to interview households has been designed in discussion with local participants who are local villagers and know well about the studied site. An investigation team has been created with the participation of local villagers who have been trained by SocMon working group for collecting data. This combination was very useful to implement the interviews conveniently and strengthened the promotion of SocMon method at local level.

The sample sizes of household survey have been identified via web based sample size calculator (<http://www.raosoft.com/samplesize.html>). Thereby 277 households were defined as the interviewees for this study.

07 local villagers were selected to train the information collection skills and involved in the household interviews. The field work has been conducted from 3rd to 12th October, 2009. The selected households have been divided into sub-groups and each member of investigation team was in charge of each sub-group to prevent interview coincidence and make sure the time used efficiently.

3. Results

2.1 Population

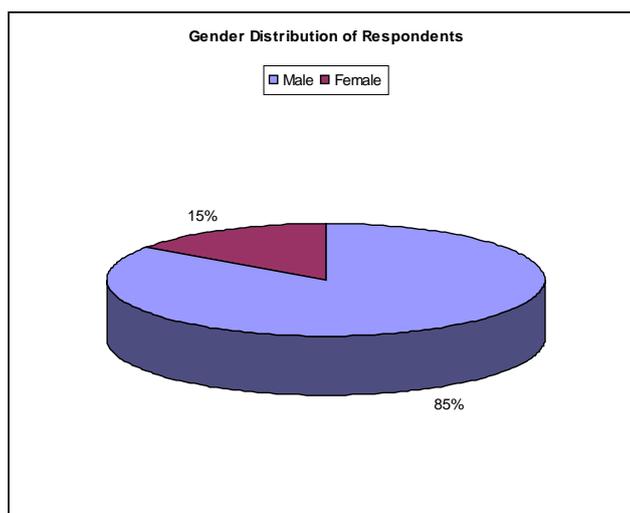
Based on the statistics provided by village leader the total population of Xuan Tu 2 village is 2,462 people of 553 households, 60% of which are women. The education level is quite high with 95% of population capable of reading and writing. The percentage of the people who are Catholic and Buddhist are successively 45% and 35%, the rest is no religion.

In early 2009 there are 517 children going to school at primary, secondary and high school levels and only 34 people graduated from universities/colleges.

According to the village chief local villagers are heavily dependent on marine resources, 75% of total population are involved in fishing and aquaculture

whereas there are only 8% doing agriculture. The average income is about 550.000 VND/person/month.

Figure 1. Gender Distribution of Respondents



2.2 Infrastructure

Approximately 40% of transport system in the area are concrete roads with the length of 941 meters invested by government budget. 100% households are accessible to electricity system. The system of telecommunication and internet cover on the whole village. Basically the village infrastructure is invested relatively (see Table 1 below for detail)

Table 1. Status of infrastructure in the studied site

Community infrastructure	Existence	Business Development	Existence
Community Centre	Yes	Banks	No
People Credit	Yes	Food Market	Yes
Electricity	Yes	Specialty shop	No
Hardroad	Yes	Sundry store	Yes
Schools	Yes	Gift shop	No
Dispensary	No	Tour operations	No
Hospitals	No	Guest houses	No
Private Clinics	No	Hotels	No
Water supply	No	Gas Station	No
Sewage	Yes		
Televisions	Yes		
Internet	Yes		
Telephone	Yes		

Radios	Yes	
Restaurants	Yes	

(Sources: Van Hung commune People's Committee)

In accordance with Xuan Tu 2 village chief there are over 81% household buildings using tile for roofing and refined bricks for walls. The materials of zinc and thatch are still used for house building but at low percentage (about 18%). This disproportion demonstrated that the living standard of local people is relatively high

2.3 Household Occupation

The main occupations of local villagers are fishing, aquaculture, agriculture, business and employee (see Table 2 for detail). Lobster and babylon snail are two key species of aquaculture. 50% of respondents consider fishing and aquaculture as their primary occupation. There are a few households holding 02 occupations at the same time (5% of respondents). Men are the key occupation holder of his family; there are male 238 main respondents (equivalent to 85%) involved in this study.

Table 2. Occupation distribution of respondents

Primary Occupation	Percentage of respondents
Aquaculture	23%
House work	2%
Carpenter	3%
Employee	11%
Agriculture	12%
Fishing	28%
Teacher	2%
Hairdresser	1%
Bussiness	14%
Animal farming	1%
Government staff	1%
Handicraft	1%

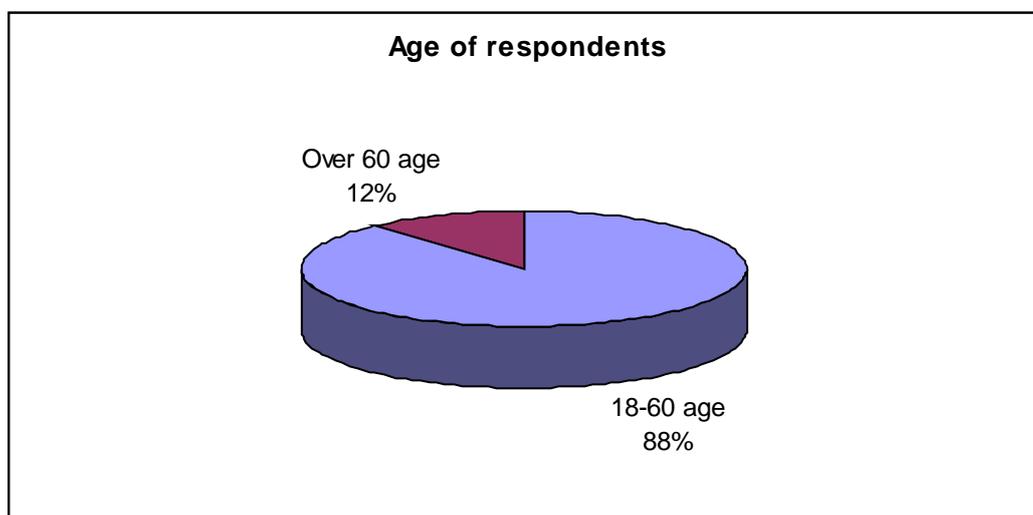
2.4 Household Income Source

The main income sources in the village come from fisheries activities, agriculture, business and employee. Among those fishing and aquaculture

account for 60% of primary income of local villagers. There a fact that some families can obtain their income sources from the money transferred from their overseas relatives and it is this source contribute partly to the wealth of the village.

It seems that aquaculture brings more income than fishing does. The statistics provided by commune authority shown that the proportion of fishing households is higher than aquaculture households (41% in comparison to 32%) but the results collected from interview data analysis revealed that the high income range belongs to aquaculture with the maximum level reported as 20,000,000 VND/month while 5,000,000 VND/month in maximum for fishing.

Figure 2. Age of respondents



2.5 Coastal/Marine Activities of Households

Fishing and aquaculture are identified as the key activities in the studied area. 31% of respondents reported their involvement in fishing and 25% admitted their concern to aquaculture. Most of aquaculture household employ the floating cages or fixed basket to grow their lobsters and babylon snails. Meanwhile the fishing gears used by fishermen are more various but equipped less than the tools of aquaculture, boat and net are employed most and only applied in the inshore area (Table 3).

Table 3. Method and tool to use marine resources in the studied area

Method/Tool	Percentage of respondents
Boat	95
Tunny net	92
Lighting	25
Dynamite	0
Electric shock	0
Strawling	5

2.6 Household Goods and Services

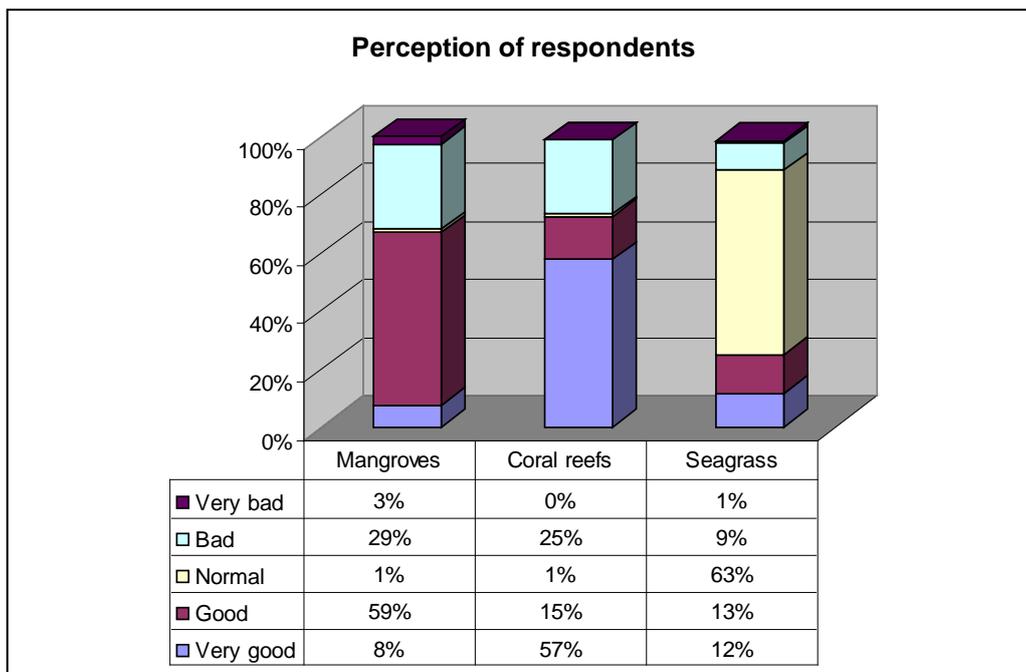
Fishing products are particularly fishes, squids, crabs and snails. Among those fishes and squids are the key species caught mainly and others are opportunistic or additional products. The catching species are often sold at the local market, especially the exploitation products of strawling almost are bought directly by the aquaculture households for feeding lobster.

Lobster, shrimp and babylon snail are the three main products of aquaculture in the village in which lobster is the dominant goods. The average price of lobster goods is about 1,000,000 VND/kg. 88% of respondents who are active in the field of fisheries stated that the goods and products produced by households primarily are sold at local and national markets. The same percentage of fisheries respondents acknowledged that all local villagers utilize their marine goods for sale, the poor quality products could be remained as a food of family.

2.7 Household Perception

The household perception of natural resources status was identified via collecting the comments on the prompt questions provided by the respondents. For coral reefs 72% of respondents said that they are good or very good. For mangrove 32% of respondents considered the bad status of mangrove, this shown that the rehabilitation needs more efforts. There are only 25% of respondents reporting the improved status of seagrass than before. These disproportions are possible to mention that there is an unequal distribution of natural resources management efforts in the area.

Figure 3. Perception of respondents



Household perception of non-market and non-use values of coastal resources was examined through 8 prompt questions together with the consent level of respondents. The examination results revealed that the respondents understood comprehensively the importance of coastal ecosystems to livelihood development however there exists a significant indecision of respondents when they were asked for deciding the development limitation in some coastal areas to facilitate and remain the natural resources for next generations. (Table 4)

Table 4. Perception of non-use values of natural resources

Interview questions	Agree strongly	Agree	Don't agree	Disagree	Disagree strongly
The reefs are important for protecting land from storm waves	47%	53%	0%	0%	0%
In the long-run, fishing would be better if we cleared the coral	0%	0%	2%	31%	66%
Unless mangroves are protected we will not have any fish to catch	29%	69%	0%	0%	0%
Coral reefs are only important if you fish or dive	1%	7%	71%	17%	2%
I want future generation to enjoy the mangroves and coral reefs	69%	29%	0%	1%	0%
Fishing should be restricted development in some coastal areas if no one ever fishes in those areas just to allow the fish and coral to grow	42%	57%	1%	0%	0%
We should restrict development in some coastal areas so that future generations will be able to have natural environment	<u>40%</u>	13%	0%	<u>42%</u>	3%
Seagrass beds have no value to people	0%	1%	0%	75%	24%

Generally the local perception of government law/regulations is relatively high with 77% of respondents saying their understanding of rules adopted by government.

100% of respondents reported that they learn about Trao Reef Marine Ecosystem Protected Area and support its establishment and implementation. 95% of respondents are heard about the aquaculture pilot model of snout clam as an environmentally friendly livelihood but 75% of respondents claimed that they are in lack of capital to run this livelihood and 25% of respondents said that they have no need to use this kind of aquaculture.

4. Discussion and Conclusions

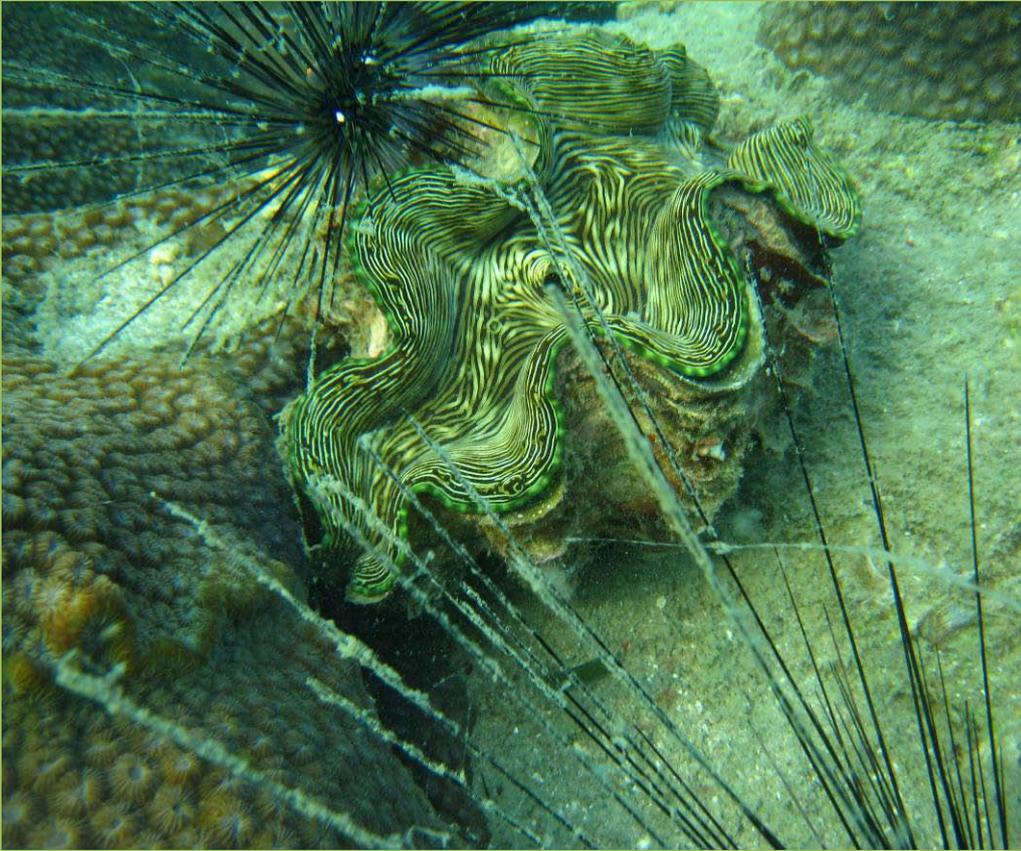
- Most of respondents are in labour age and this advantage is possible to mention about the plentiful employment source of the village. However there is an irrelevant distribution of occupations in terms of gender, men are the main holders of jobs within their families whereas women play their supporting role in terms of logistics and house work. Many women have no a specific occupation to generate the additional income of family, especially the households active in fishing and aquaculture. This disadvantage probably did not only demonstrate the heavy dependence on the natural resources but also the high vulnerability to climate fluctuation.
- The aquaculture practice of local people is required food made from small marine species. The fact that this need possibly provided the income opportunity of a small group of strawling fishermen but the big consequence is clearly seen. Environment pollution caused by the organic redundancy from the floating cage of lobster and babylon snail was effect on the health of neighboring coral reefs and seagrass ecosystem. Moreover this practice of aquaculture could be considered as a significant motivation of unsustainable fishing (strawling), decreasing and destroying the fisheries resources existing in the area and negatively affecting the livelihood of other fishermen.
- The high consideration of respondents with the role of Trao Reef Marine Ecosystem Protected Area particularly revealed the influence of this LMMA on the studied area. This conclusion could be demonstrated by the understanding of local villagers about the relationship between the coastal ecosystems and local livelihood development as well as the household perceptions of the rehabilitation and improvement of coral reefs and seagrass. However these initial results seemed not to be enough to persuade local villagers to support totally the marine conservation practice because the challenges of sustainable livelihood development are still existed and difficult to deal with. The recent implementation of environmentally friendly livelihoods being supported by local authority and NGOs is considered as the solution to reduce the pressure on the natural resources. Nevertheless livelihood development is a long-term process and required to provide with the good conditions of market,

capital, and awareness and implementation capacity. This information was not enabled to identify in this study therefore they are needed to take into account in the next assessments and studies.

5. Recommendations

- Strengthening the periodical inspection and strict handling to reduce the violations of government regulations
- Improving the awareness campaign and education program of regulations of fisheries protection
- Assist and instruct the local villagers to participate and be supported in the livelihood conversion program, especially fishermen.
- Facilitate the credit agencies to loan local fishermen with preferential interest to practice the existing and alternative livelihoods.
- Facilitate the community base ecotourism as an alternative livelihood to mobilize local community to get involved in the sustainable use of natural resources.
- More training is required to take place to provide SocMon working groups with more comprehensive skills of data analysis and reporting.

FISHERIES ACTION COALITION TEAM



Socio-economic Monitoring of Coral Reef in Koh Rong Island, Preah Sihanouk Province, Cambodia

2010

**An Assessment Report
Submitted to: MCD
Date of submission: April 8, 2010**

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Prepared by:

FOREWORD

The Fisheries Action Coalition Team (FACT) is a coalition of local and international NGOs, established in 2000, that focus on environmental issues around the Tonle Sap Lake and in particular monitor the fisheries sector.

FACT works closely with fishing dependent communities around coastal region and Tonle Sap, in Cambodia's upper and lower Mekong regions, and the coastal provinces supporting them in building their organizations and networks so that they can advocate effectively for themselves on issues that affect them. FACT also advocates to decision makers to explore alternatives for fishing communities in order to improve their livelihoods.

FACT is presently implementing five programs, with an underlying emphasis on human rights, sustainable livelihoods, education, and awareness raising. FACT also involves in gathering information on fisheries issues, collecting facts and opinions, analyzing and distributing it to governmental line agencies, donors, and other relevant people, as a mean of advocating them for the supports of fishing communities. Furthermore, FACT facilitates dialogues between NGOs, CCFs and other relevant stakeholders (local authorities, specialized institutions etc.) to debate, discuss and find solutions on fisheries issues and conflicts.

Recently FACT is playing a crucial role in working to empower the local people in order to protect and manage natural resources in properly way. Mangrove forest, coral, sea grass, sea weed are the important shelter for marine species. On the contrary, this kind of shelter is damaged day to day due to the illegal behaviours and privatization in Cambodia. By looking this issue in coastal region, FACT is now working on natural resources managing by empowering community.

We hope that this assessment can be a good baseline for this area for under taking any projects. It will be also useful for managing of concerned stakeholders in this area. Some recommendations and lesson learnt can help the authority, community and others who are working in this area to make a good plan for managing the natural resources. Therefore this result is important for study, research, and developer also.

We also hope this result can use to apply in other area in Cambodia to conduct the assessment, especially the lesson learnt which we found during field work.

Yours sincerely,
Fisheries Action Coalition Team

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1. Site description

The island of Koh Rong is located offshore about 34 Km from and northwest of the mainland of Sihanoukville port. It lies between the coordinates of UTM 1178 to 1192 N, and 3028 to 3165 E. Geographically, Koh Rong is the second largest island in Cambodia covering an area of approximately 9,997 ha after the island of Koh Kong (in Koh Kong province), and lies between the well-known touristic destination islands of Koh Rong Samlem (toward the south) and Koh Ta Team and Koh Mneas (to the north). Koh Rong has three subordinated small islets locally known as Koh Oun (lady), Koh Bang (man) and Koh Daung.

Administratively, Koh Rong hosts four villages: Daem Thkov, Koh Toch, Prek Svay and Sok San, but only the former three were legally registered with the Ministry of Interior. Daem Thkov is located east of the island, Koh Toch on the south, and Prek Svay on the northeast end (Fig 1). The boundary among the four villages has not been clearly demarcated. The population is concentrated on the southern and eastern coast of the island as most people are fisherman. This area is mostly flat, forming a slightly small estuarine area of the island. The northern and southern parts of the island are geologically characterized as having many cliffs and are inappropriate for settlement.

The village of Prek Svay was reportedly established a long time ago, probably since the King Norodom Sihanouk regime (1953-1970). A number of old planted coconut trees indicate the presence of a few established houses during this time. From 1975 to 1979 during the Pol Pot era, local inhabitants were totally evacuated to the mainland, mostly to Botum Sakor district of Koh Kong province. The village as well as the whole island was then used as a military base. Interestingly, during the period of 1979-1990, in addition to becoming a naval base, the island was also used as the stop off point for smugglers trading illegal commodities from Thailand which were being sent to Kampong Som town (which is now legally named Sihanoukville). After 1990, approximately 40 families of original inhabitants who survived the Pol Pot era returned to the village, some settling on land lots left from their parents or grandparents.

Since then the number of households have tremendously increased. Most likely this is due to an abundance of natural resources (eg fish) and the many livelihood opportunities the island offers. Most new immigrants came from the provinces of Kampot, Koh Kong, Kampong Speu, Takeo, Prey Veng, and Svay Rieng. As of February 2010 statistics from the village head state that the total number of households is as many as 148 with a total population of 677 persons, of which 319 persons are female. However, during household surveys conducted in early March 2010, we found the exact number of households currently having permanent residents within the village of Prek Svay accounts to only 122 households. The village head explained that those who were not present at the time of survey emigrated to other provinces in search for jobs, they returned during the election events (national and commune).

Due to awareness of increasing depletion of natural resources on the island, the villagers in Prey Svay initiated a community fishery in 2003 with the assistance of Fishery Cantonment in Sihanouk Province. The community is legally entitled "Phumi Prek Svay Community Fishery" and registered with the Ministry of Agriculture, Forestry and Fisheries with lawful recognition from local authorities (commune to provincial levels). The community was provided with a total sea area of 7,447 ha for sustainable exploitation and conservation of fishery resources, including coral reef, sea grass and mangrove.

Since the establishment, the community had not moved in a smooth manner mainly due to a lack of technical and financial support as well as inexperience in community fishery projects. However, in 2008 with assistance from Danida-DFID funded Project through Fisheries Administration (FiA), the community appeared to have had remarkable progresses and it is recognized a modal community fishery within the coastal provinces of Cambodia. Among these achievements are those of demarcation of community fishing ground by plastic buoyants (paid by community members), crab bank (for hatching the egg bearing crabs captured wild), aquaculture (snappers supported by the above project), building community office and a wooden port connecting cages of crab bank (community contribution). In addition to support of the cage, the project also procured the community with a speed boat for conducting patrols in order to suppress illegal activities.

Although, there is much support from the relevant government agencies, NGOs and donors, the community, particularly executive committee, is still facing a lack of technical skills over organization and management of the fishery. Furthermore, the capacity to tackle against large scale illegal fishing activities like push-nets and trawls has remained a significant issue. There is a need to provide them with sufficient training on capacity building so that they are able to tackle newly emerging issues and problems within their community. Community education and awareness raising on the significance of coastal/marine resources would definitely encourage community people to take part in conservation and protection activities.

2. Goals and objectives of the assessment

The primary purpose of this assessment is to collect baseline information about the socio-economic situation of the local community involved marine resource conservation in Koh Rong island and perhaps uses this informations a representative case study of the whole population of coral reefs within Cambodia. Moreover, the specific objectives of this study were confined to:

- Assess the perspectives of local people on coral reef and other associated species
- Assess the socio-economic status of community fishery on the island
- Evaluate the awareness of local people on natural resources and law/regulation

The research findings will be used to strengthen the capacity of community fishery in better management of coastal and marine sources for sustainable utilization within the community. Beside this, the results will be used to inform the concerned government officials for proper support, especially to fight against the anarchical fishing activity committed by powerful people within their fishing ground. Also, concerned NGOs and donors will use the results for expansion of their activities to the community with concerted common efforts of conservation of coastal and marine resources.

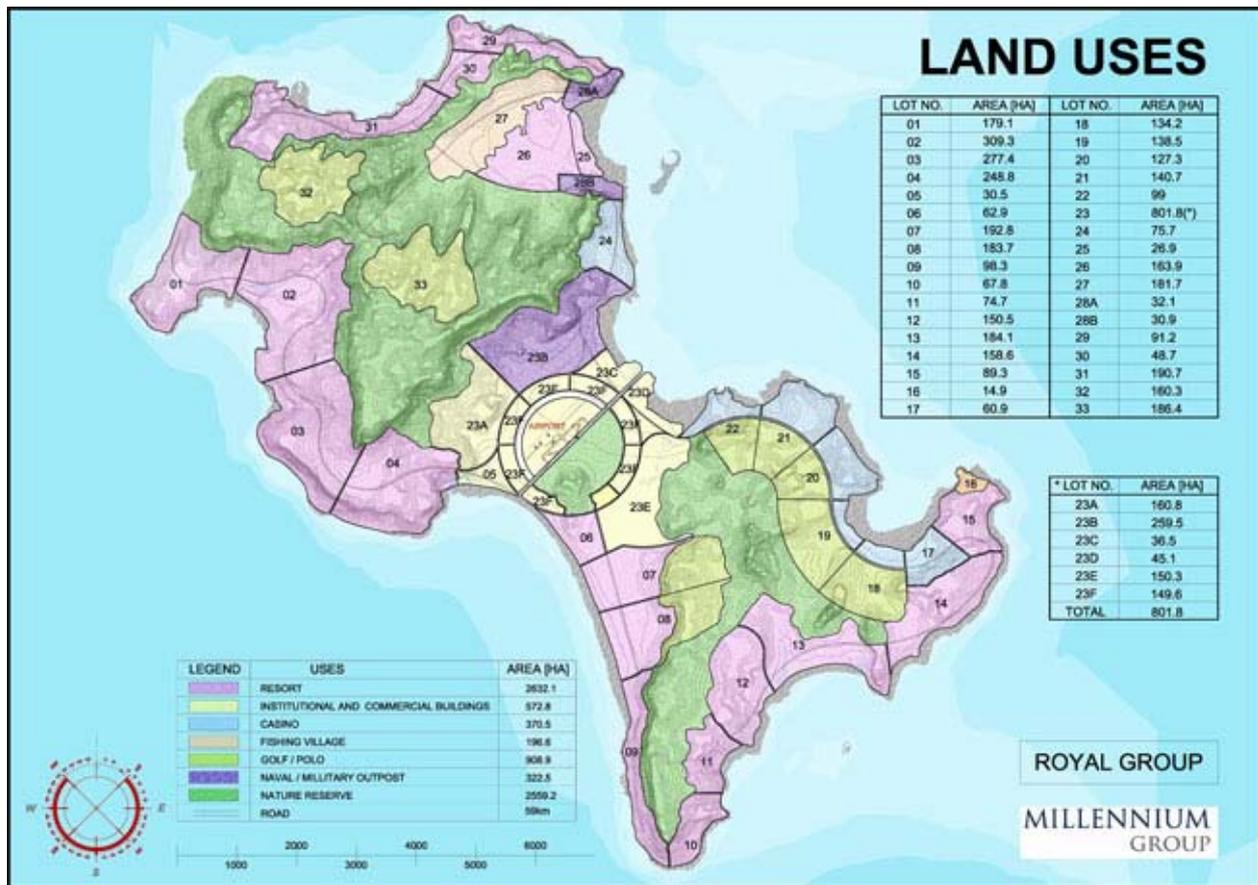


Figure 1. Land use map of Koh Rong (a temporary map, it will be inserted once administrative one is completed) (Royal Group, 2009)

3. Indicators Selected

The indicators employed for this assessment are solely based on the standard guideline of SocMon developed for the ease of use. As can be seen in the guideline, all the indicators listed are appropriate to the social, political and ecological context of Cambodia’s coastal community. Although, there is a minor rearrangement of indicators listed in secondary source/key informant and household interviews, it is a matter of need to make the data collection process easy due to time and finance constraint. The table 1 below summarizes selected indicators used in this study.

Table 1. Summary of selected indicators

Category	Indicators
<i>Demographics</i>	<i>Study area</i> <i>Household size</i> <i>Age and Sex</i> <i>Ethnicity</i> <i>Religion</i> <i>Language</i> <i>Education</i> <i>Occupation and Sources of Income</i> <i>Migration</i>

<i>Community infrastructure</i>	<i>Major infrastructures existing in the study site</i>
<i>Coastal/marine activities</i>	<i>Coastal and marine activities Goods and services and their values Market orientation of goods and services Household uses of goods and services Types of use and use patterns Types and levels of impact Level of use by outsiders</i>
<i>Governance</i>	<i>Management body Management plan Enabling legislation Resource allocations Formal tenure and rules Informal tenure and rules customs and traditions Institutions and stakeholders</i>
<i>Threats</i>	<i>Perceived threats to coastal management</i>
<i>Attitudes and perceptions</i>	<i>Household attitudes and perceptions towards coastal/marine resource management Awareness of rules and regulations Compliance and enforcement Participation in coastal management rules and regulations</i>
<i>Perceived problems, challenges and their solutions</i>	<i>Perceived coastal management problems and their solutions Perceived community problems and their solutions Success in coastal management Challenges in coastal management</i>
<i>Material style of life</i>	<i>Types of household buildings</i>

4. Methods

By following the SocMon data collection guideline, the tools for data gathering which were employed for this study are those of: 1) key informant/secondary source and focus group discussion, 2) Household survey, and 3) Observation (See Appendices 1A and 1B).

4.1 Key Informant/secondary source and Focus group discussion

The secondary source of data such as laws and regulations, past study's on the coral reef including related coastal/marine resources, maps and formal documents of Phumi Prek Svay community fishery, and previous study document relevant to coastal/marine resource management were also considered for this study. These were almost all collected from Fisheries Administration headquarter in Phnom Penh and online sources.

Key informant interview checklist merely followed the standard indicators mentioned within the SocMon guideline, although several new indicators such as history of the study area, geographical patterns and status of natural resources were also added for the in-depth understanding of community settings. In order to collect adequate data based upon the stated indicators within time constraint, two methods of key informant interview and focus group discussion were employed. The field work was carried out during 26-28 Feb 2010. The key

informant interviews were made with village chief of Prek Svay, head of community fishery, experienced elder fishers in the village, and fishery officials of FiA at Phnom Penh on community formality, rule and regulation on resource management and conservation.

The focus group discussion was also undertaken separately from key informant interview, with approximately 20 active members of the community, including the community head and community committee members. The opened questions of household indicators such as H9, H17, H18, H21, H22, H23, H24, H25, H26, and H27 were included in focus group discussions as well. This particularly helped us grasp the overall answers towards each question given by the community and allowed for a kind of standardisation of results from the individual household surveys.

In this regard, the group discussion was divided into three sub-groups mainly pursuant to categories of set indicators and experiences each participated member has had. The arrangement allowed the members to be concentrated on the issues with which they were most familiar. The three groups are those of working on 1) KS indicators, 2) participatory community mapping, and 3) H indicators aforementioned. Each group was actively facilitated by experienced researchers, making sure each participant had an equal opportunity to express their opinions with thorough consideration of gender balance. However, each group mutually exchanged information if any question could not be addressed by another. Participatory community mapping was specifically employed in order to gain an in-depth understanding of and map out geographical settings, infrastructure, locations of particular natural resources (like coral reef, sea grass, mangrove, freshwater, upland forest, etc), boundary of community fishery area, and fishing activities.

4.2 Household survey

By using the data from the first field work exercise of key informant interview and focus group discussion, the household survey questionnaire was carefully manipulated and prepared with inclusion of answers of above stated household questions into the finalized questionnaire (Appendix 1B). This would allow the field enumerators as well as respondents to easily to fill in and answer questions accordingly, but there was room for household respondents to address additional answers that were not raised.

Because the community people in the studied village were largely homogeneous in terms of occupations (fishing and farming), no special sampling method was necessarily employed to select the sample for interviews. The sample size was randomly selected by applying the rule of thumb (30 percent of the total households within the village). Random sampling methods by lucky draw with assistance of household lists provided by village chief, was used. Based on these statistics, 43 households were randomly drawn from the total number of 148 households legally registered in the village.

Seven student enumerators were carefully trained to handle the household interview questionnaire. During the field work (5-9 Mar 2010), each enumerator was also assisted by one field assistant (chosen from local fishers) in order to identify the selected households for interview, locating where they stayed in the village. During lunch and dinner time, already filled in questionnaires by individual enumerators were thoroughly checked for consistency of data entered during individual household interview. It was also ensured that each question was properly filled in. Hence, it was also a good opportunity to share fresh experiences of methods used to ask questions and obtain very concise answers from respondents.

4.3 Observation

This tool was mainly employed to record the hidden data or information respondents were afraid of expressing freely during the open interviews and discussion groups. In addition, this was used to get some indication of local customs, traditions, fishing gear used and economic activities including illegal fishing activities occurring within the community fishing ground.



Figure 2. Participatory community mapping and Focus group discussion

5. Results

5.1 Community Demographics

During the course of the field survey, the total population currently residing in Prek Svay village accounts for 677 persons, of which 319 persons are female, forming a total number of 148 households (families). By computing the percentage of population based on the distinct age groups, it was estimated that 25 percent of the population was at the age of 0-18 years old, 15 at 19-30, 45 at 31-50, and 15 percent at the age of over 50. Therefore, the labour force of the working population at age of 19-30 is relatively low, which places most working households in a difficult position.

As the village is relatively isolated from the urban area and mainland, the average household size is not large, and estimated to be as low as 4.8 persons including spouse, children, grandparents (little numbers of relatives who stay temporarily for seasonal earnings). The minimum household size was 2 persons (mostly spouse), whilst the maximum was 8.

The majority of the population inhabiting in Koh Rong island were Khmer, although there is one family representing a Muslim (Cham) ethnicity and another Vietnamese who is now registered as Khmer national as well. In term of religion, Buddhism encompasses approximately 99 percent of people on the island, while only one family were Muslim. However, and there is no significant indication of discrimination.

Although, the island is offshore and with little educational facilities, including school buildings, teachers and teaching materials, about 90 percent of the whole population has at least a rudimentary proficiency in reading and writing Khmer. There are three primary schools on the

island, one of those is located in Prek Svay village. Better off families were able to send their children to secondary, high schools and even university in Sihanoukville or Phnom Penh.

After 1990, in addition to the returnees coming back to their homeland, many people immigrated into the island from many provinces of the country, beginning with the first 40 households and now arising up to 148 as of March 2010 statistics. During past several years the migration rate was relatively low, because people realized that fishery and island forest resources were no longer free and available. Immediately earlier 2010, three families immigrated into the village, and during 2009 some 23 families sought a livelihood opportunity outside the island, but their residences were retained in the village and so were their names.

5.1.1 Occupation

As the community people are heavily dependent upon natural resources, their main occupations are much more engaged in fishing and farming than other communities on the mainland. According to a village chief, as high as 90 percent of total households (148) made their living from fishing and farming and approximately 15 families in Prek Svay village were involved in full time fishing.

The table below shows the occupation by each household member. Fishing and farming are the major occupations and accounts for 24 percent of the total numbers. Ten percent of them said petty grocery and food vendors as their occupation and 8 percent as workers. Within households, about half the members do not generate any income as they are either old or students (Table 2).

Fishing and farming are interchangeable economic activities of most households in the village. As Cambodian people are accustomed to use rice and fish as a staple food, fishing provides animal protein consumption, while rice is a major source of daily energy consumption. Likewise, as the island is far from the mainland, the islander people have adapted the self-dependent sufficient economy via engaging in fishing and farming and they are not concerned about how to search for rice at, and transport from, the mainland. Moreover, there are favourable conditions including ferrite soil, high rainfall and suitable temperature which are excellent enabling factors for farming.

Outside work included casual and garment work. Only three persons were reported to have sought jobs in Phnom Penh as garment workers. The casual workers were reportedly finding their jobs within private companies (Pro Corn and Royal Groups for development of tourism facilities) on the island as security guard, construction workers, cleaners, house maids, etc. Pro Corn (an Australian company) is currently developing Koh Oun and Koh Bang islands opposite Prek Svay village. Royal Groups owned by Oknha Kit Meng in joint venture with a American firm, works on the main island of Koh Rong, especially on road construction, and resort facilities for tourists. Although, as observed during the course of field work, the speed of construction and preparation for touristic activities appeared to be slow, thus at this time this development may not sufficiently benefit the local people rather than employing little number of villagers as casual workers.

In term of tourism, there is one family who run a guesthouse as a secondary occupation. It served all types of tourists, but catered predominantly to local tourists (offering only basic services)

Table 2. Occupation of villagers in Prek Svay

Occupations	Primary		Secondary		Total percent of community members dependent on primary and secondary occupation
	Number of household listed as primary occupation	Percent of household members listed as primary occupation	Number of household listed as secondary occupation	Percent of household members listed as secondary occupation	
Fishing	37	17.29	14	7.25	23.83
Farming	28	13.08	23	11.92	23.83
Worker (garment and casual worker)	15	7.01	3	1.55	8.41
Fishery trading (middleman)	5	2.34	0	0.00	2.34
Petty Grocery and food vendor	12	5.61	10	5.18	10.28
Transportation	5	2.34	3	1.55	3.74
Logging and woodfuel collecting	6	2.80	3	1.55	4.21
Government servants	5	2.34	0	0.00	2.34
Boat and house building/repairing	3	1.40	3	1.55	2.80
Tourism	0	0.00	2	1.04	0.93
Others(old people, student)	98	45.79	132	68.39	107.48
Total	214	100.00	193	100.00	190.19

By working on age groups and educational levels (Table 3), 61.5 and 69.2 percent of respondents at the age of 31-45 and with primary education, respectively, have primary occupations as fishermen. However, 54.5 percent of respondents at an age over 45 years old were engaged in farming as their primary occupation, with 63.6 percent having had primary education. This indicated that people with older ages were more interested in farming than fishing as they may be unable to go away from home and no longer able to physically conduct fishing activities.

Workers at ages of 20-45 years old and with primary education represented some 86 and 71.4 percent of respondents, respectively, that were employed by the private firms on the island. People at age of over 45 were rarely employed by private firms, because their manual labour strength is relatively weak, being unable to handle heavy work.

Fishery trading (middleman) and petty grocery/food vendor attracted 100 and 50 percent of villagers at age of over 45 and 20-30 years old, respectively, who noted as primary occupation. Petty grocer and food vendors had pursued education from primary (33.3%), secondary (50%) and university (16.7% of total respondents) levels. On the other hand, fish traders had no education at all. This is because only one household (total three households in village) who had a chance of having been chosen for questionnaire interview.

All respondents who were involved in the transport sector or collected woodfuel or did logging, as their primary occupation, were over 45 years old. This is because in the village studied, transportation is operated by only one household. Both respondents have primary education.

About 50 percent of villagers in each age group of between 31-45 and over 45 are government servants. Half of them have primary education while the other half has no education. However, a low illiteracy rate (10%) indicates that many villagers received informal training. Boat and house building/repairing made up 100 percent of respondents within age groups of 20-30 and

31-45 years old who could deal with heavy duty, whilst people at age of over 45 was not good at this work.

Table 3. Primary occupation arranged by age groups and education levels

Primary Occupation	Percent Responses							
	Age 20-30	Age 31-45	Age over 45	Primary school	Secondary school	High school	University	No Education
Fishing	15.4	61.5	23.1	69.2	7.7	7.7	0.0	15.4
Farming	27.3	18.2	54.5	63.6	18.2	9.1	0.0	9.1
Worker (garment and casual workers)	42.9	42.9	14.3	71.4	0.0	0.0	0.0	28.6
Fishery trading (middleman)	0.0	0.0	100.0	0.0	0.0	0.0	0.0	100.0
Petty Grocery and food vendor	50.0	33.3	16.7	33.3	50.0	0.0	16.7	0.0
Transportation	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
Logging and woodfuel collecting	0.0	0.0	100.0	100.0	0.0	0.0	0.0	0.0
Government servants	0.0	50.0	50.0	50.0	0.0	0.0	0.0	50.0
Boat and house building/repairing	50.0	50.0	0.0	50.0	0.0	0.0	0.0	50.0
Tourism	0	0	0	0	0.0	0.0	0.0	0.0

In traditional Cambodian society, men are usually responsible for heavy work while woman work at home (sale of fishery products, repairing nets, cooking, washing, etc). For fishing occupations, men occupy as high as 77 percent of the labour force within households interviewed, while woman as low as 23 percent. Similarly, approximately 64 percent of men were engaged in farming, whereas 36 percent of women were. In term of religion, among the 43 households interviewed (the whole village), one family is Cham and were Muslim, engaging in fishing and farming, and the rest were Buddhist.

Interestingly, fishery trading and petty grocery/food vendors have a higher percentage of women amounting for 100 and 66.7 percent, respectively.

Transportation, logging/wood fuel collecting, and boat and house building/repairing commanded labour forces specifically served by men who are able to manage heavy work. Whilst, government servants (comprising of village committee members, police, navy and teacher living within the studied village) required labour force each half from man and woman, as they are mostly involved in operation of administrative works.

Table 4. Primary occupation arranged by sex and religions

Primary Occupation	Percent Responses				
	Male	Female	Buddhism	Muslim	Christian
Fishing	76.9	23.1	99.3	0.7	
Farming	63.6	36.4	99.3	0.7	
Worker (garment and casual worker)	71.4	28.6	100.0		
Fishery trading (middleman)	.0	100.0	100.0		
Petty Grocery and food vendor	33.3	66.7	100.0		
Transportation	100.0	0	100.0		
Logging and woodfuel collecting	100.0	.0	100.0		
Government servants	50.0	50.0	100.0		
Boat and house building/repairing	100.0	.0	100.0		

5.1.2 Household Income sources

The income sources in the village included fishing, farming, garment and casual labour, small merchandise, boat/house construction/repairing, logging and wood fuel collection, transportation, government jobs and tourism (only one 6 room guesthouse in the village centre). Among those, fishing and farming make up about 60 percent of primary income sources for the villagers, followed by garment/casual work and petty grocery/food vendor. Three quarter of families obtain a certain percentage of income from either fishing or farming. House and boat construction/repairing, government jobs, logging and wood fuel collecting, and transportation have small amounts of people who undertake them as a primary occupation. Within the village, one household operated boats construction and repairing yard with several workers from within the village. Similarly, there is also one household conducting transportation as a primary occupation, which transported passengers to and from Sihanoukville and Koh Rong island at one trip per two days.

Table 5. Household income sources

Occupation	Percent noted as primary source	Percent noted as secondary source	Percent noted as tertiary source
Fishing	30.2	14.0	4.7
Farming	30.2	16.3	4.7
Worker (garment and casual worker)	18.6	2.3	2.3
Petty Grocery and food vendor	11.6	2.3	2.3
Boat and house building/repairing	4.7	0	0
Government servants	2.3	9.3	0
Logging and wood fuel collecting	2.3	4.7	0
Transportation	2.3	0	0
Tourism	0	2.3	0

Types of household buildings

Zinc is the most popular material for roofing in the area followed by thatch. Over 90 percent of household buildings used either of these two materials. Tile and plastic roofing was relatively minor. For the structural walls, wood is the most common material being used. 77 percent of household buildings were using wood for the outside structural walls. Zinc, brick and concrete, thatch and bamboo and tree bark are other materials being used by the respondents. There are many houses without windows (35 %) and those equipped with windows are using wood (40 %) and use 'hall' in the wall as window (14 %). Glass or plastic windows are not very common in the village. Over 85 percent of houses are using wood and plastic as floors, because they have long lifetime against the salinity. Tile, bamboo and dirt are occasionally used for flooring (2 to 5 %).

Table 6. Material style of life

Types of Household Buildings	Material	No. of HHs	Percent respondents noted
Type of roof	Tile	1	2
	Zinc	33	77
	Wood	0	0
	Thatch	6	14
	Plastic	1	2
Type of outside structural walls	Zinc	1	2
	Brick and concrete	1	2
	Wood	33	77
	Thatch and bamboo	2	5
	Plastic and tent	0	0
Windows	Tree bark	3	7
	Glass	1	2
	Wood	17	40
	Open	6	14
	None	15	35
Floors	Plastic	1	2
	Tile	2	5
	Wood and plastic	37	86
	Concrete	0	0
	Bamboo	1	2
	Dirt	1	2



Figure 3. Type of household buildings with wood and zin

5.2 Community Infrastructure

5.2.1 Basic infrastructure

Infrastructure in the island has been poorly developed due to isolation from the mainland and a small population. After the government granted the island to private firms for the touristic destination concession, the infrastructural facilities like road networks and resorts are under planning and construction by those private firms. When completed, roads could be used by the community as well. As could be seen during the survey and results generated by participatory community mapping, there are roads (constructed by Royal Groups in Daem Thkov village), primary schools, healthcare centre, commune office, communal police office, community fishery office, local port, guesthouse, one typical pagoda, potential tourist sites and mobile phone antennas which can be seen from the distance.

Road: There is only one main road in the island situated in Daem Thkov village, southeast of island, and being constructed by **Royal Groups** in early 2010. The company has reportedly traced and demarcated the forested straits around the island for road construction. Boat is the only single means of transportation for people on the island.

Local authority offices such as **commune office, commune police office, and a healthcare centre** are located in Daem Thkov village (where the navy base is located).

Local ports and community fishery office: There are eight local ports for transportation (uploading and unloading daily passengers and commodities shipped from Sihanoukville and elsewhere) operated by different owners. One village is equipped with at least one port. But Prek Svay has two (one of these built by Community Fishery) and unregistered village of Sok San (southern part of island) has three which were used for tourist and passenger transportation purposes. Marine border police unit stationed in Koh Toch village (south) has built a port and a naval unit locate in between Daem Thkov and Prek Svay villages.

In order to facilitate the organisation, function and proper management, Community Fishery in Prek Svay has constructed a typical wooden building sitting on the coast, with a shared cost from its members.



Figure 4. Local port and cottage for crab bank built by community people in Prek Svay

Schools: There are basically three primary schools; one in Daem Thkov village, one in Sok San village, and another in Prek Svay village. In addition, two pre-primary schools (kindergarten) are also available in Daem Thkov and Prek Svay villages. However, there is neither secondary school nor high school in the island. Students who want to continue to these levels have to go to Sihanoukville or Koh Kong provincial town.

Tourism site: The main tourism site in the Koh Rong is located in Sok San village. The shoreline covers with the beautiful beach which can be developed into a resort. Other sites included Koh Toch and Koh Sangsa (Koh Oun-Koh Bang islands) immediately opposite Prek Svay village. Moreover, there are several locations of beautiful beaches for tourists around the island. There is a six room guesthouse operated by household members of village chief of Prek Svay (premium price at 5 USD per night).

Mobile phone antennas: In Prek Svay territory, there are three mobile phone antennas being operated by distinct firms Mobitel (012), Mfone (011) and Hello (016). Whilst, two Metfone (097) antennas are positioned on the southern part of the island.

Electricity: There is no regular electricity supply in the assessed area, the electricity is generated by small diesel generators run by local people. The lightening time is available during night time from 6:30pm to 9:30pm.

Resettlement areas, market and religious temple: People in the island settle mostly on the beaches and estuary where they have easy access to transportation and livelihood activities. Sok San, Koh Toch and Prek Svay villages sit on the beaches, while Daem Thkov is located in the reef area where it is more populated than other villages on the island.

There is no major market on the island, although sale and purchase often take place at individual houses acting as a typical shop. In Prek Svay village, there are several typical food shops situated in the village centre, and some of those offer grocery sale as well, including fishing gear. The grocery as well as fishing gears and other commodities for basic needs are taken from

Sihanoukville. It was reported that a commune chief of Koh Rong has controlled this business and is the only powerful merchant on the island.

There is one Buddhist temple in Prek Svay village, that is used by followers (most of villagers are Buddhist) for various Buddhist related festivals. Traditionally, the temple also plays an important role for education of villagers, especially for conservation of localized resources.

5.2.2 Geographical Patterns

The island extends diagonally northwest to southeast and is geographically divided into two interconnected parts of hills by slightly flat plains in the centre. The hills have patchy and fragmented forest cover as the forest has reportedly been logged for commercial timber since the 1980s. With the stable increase of population into the island since 1990s, many parts of forested area have been clear-cut for agricultural purposes including rain fed rice and upland crop farming which takes place mostly on coastline of eastern part of island. Several small streams flow to the east, particularly to the areas which form the beach. Beaches surround almost the entire island, except locations with reefs.

Prek Svay village extends on a beautiful beach which might be formed by sand deposition by natural process through a stream originating from nearby hills. The beach extends about 500 m down into the sea and can be distinguished clearly during the low tide.



Figure 5. Beach in front of Prek Svay village during low tide (March 2010), Koh Bang and Koh Oun at the distance

There are ten small streams scattering in the island, which are sources of freshwater for domestic use during raining season. There are three streams in the studied village. One of them namely Prek Bang Oun flows across the village centre where populated settlement area takes place. Other two (Prek Bet and Prek Svay) are located outside the resettlement area. These three streams perhaps form an estuarine area to support a mangrove area of about 57 ha in the community.

Total area of farmland was not known, but area for rain fed rice reportedly covers approximately 6 hectares and upland cropping farms scattered on hills of perceived Prek Svay territory (separate from 6 ha rice field). Coconut trees are popular upland crops amongst people on the island, and can be found on most of beaches.

5.3 Coastal/marine natural resources

Natural resources in the area such as fishery, coral reefs, sea grass, mangrove, upland forest and wildlife play a very important role in sustaining livelihoods of the local communities and development of local economy.

Little was known about fishery resources in the studied island, but a recent rapid assessment conducted by a team of scientists for Cambodia Reef Conservation Project (CRCP) from Coral Cay Conservation, Fisheries Administration (Cambodia) and the Dive Shop have identified several commercial fish species. Those are groupers, snappers, butterfly fish, and yellowfin Barracuda, which are frequently found around the island (van Bochove et al, 2009). However, according to the 1982-1986 study by scientists from the former Soviet Union and Fisheries Administration (formerly Department of Fisheries), 474 species from 105 families have been identified from Cambodian offshore marine waters (Touch and Todd, 2003).

Coral reefs and sea grasses are considered a productive tropical forest ecosystem and known to support high biological diversity of aquatic fauna, serving as feeding, spawning and sheltering habitat for fish and variety of marine life forms. The coral reefs and sea grasses intermingle with one another, particularly around islands (MOE, 2005; Mam, 2002), which was also reportedly found in Koh Rong. According to the Asian Development Bank (ADB) survey (1999), the coral reef area was estimated to be approximately 476 ha and sea grass is about 175 ha within Cambodia marine waters. There has not been extensive studies to document the number of coral species, species composition, and its ecology all over the Cambodia sea, but in Sihanouk province, about 24 species of common hard coral and 14 species of soft ones were recorded (Sihanoukville Municipality, 2001). Furthermore, it was reported that eight species of sea grasses were recorded in Cambodia (Mam, 2002) and perhaps these same species exist in an area around Koh Rong, which was confirmed by local fishers in the studied village. According to van Bochove et al (2009), the coral diversity was dominated by *Massive Porites* and *Diploastrea heliopora* species which were found abundant in an area between islands of Koh Rong and Koh Rong Sanlem.

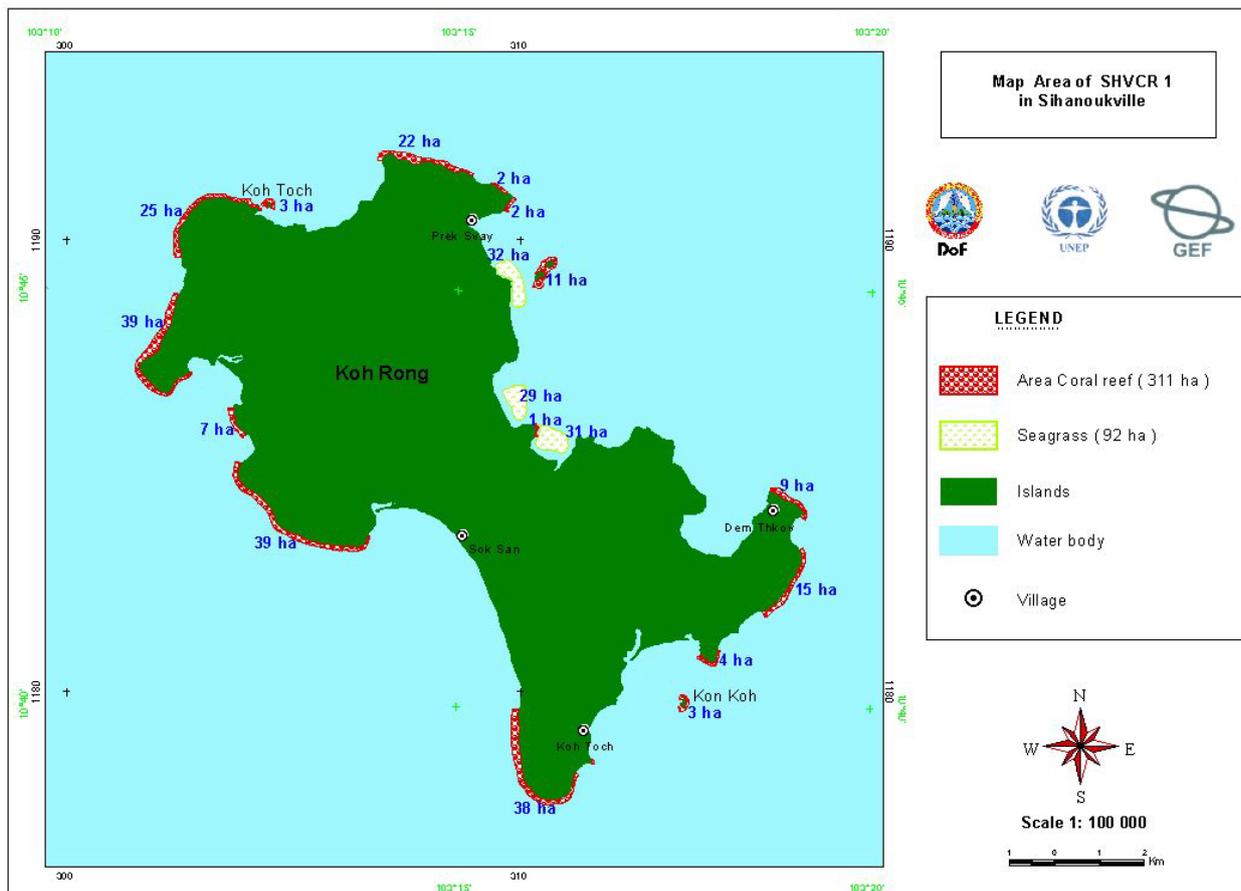


Figure 6. Map of coral and sea grass in Koh Rong (Source: DOF, 2002)

The mangrove forest area is relatively small due to small area of estuary on the island as well. Community people, however, reported that the existing mangrove area was estimated to be about 15 ha and about six dominant species could be identified easily via local names which were then cross-checked for scientific ones. These are *Rhizophora apiculata*, *R. mucronata*, *Avicennia marina*, *Bruguiera gymnorrhiza*, *B. sexangula* and *Ceriops* spp (MoE/IDRC, 1995).

Detail about species composition and structure in upland forest were not known. Although, according to responses on perception of resource conditions in the studied area, upland forest is overall in good condition (ca 54%) and wildlife is neither good nor bad.

Perceptions of Resource Conditions

The perception of resource conditions in the area including fish, coral reefs, sea grass, mangrove, wildlife, freshwater and upland forest is examined. For coral reefs, mangroves and freshwater environment, about 90 % of the respondents said that they were above average conditions (answered either 'good', 'very good' or 'excellent'). For fish, sea grass and upland forests, the number is around 70 %. On the other hand, nearly 50% of respondents said that wildlife was either in bad or very bad conditions while none of them answered it was in the excellent condition.

Table 7. Perceptions of Resource Conditions

Resources	Percent Responses That Describe Resource Conditions As:				
	Excellent (5)	Very Good (4)	Good (3)	Bad (2)	Very bad (1)
Fish	0	4.8	66.7	26.2	2.4
Coral reefs	7.7	61.5	20.5	10.3	0
Sea grass	5.3	15.8	50.0	26.3	2.6
Mangroves	4.7	48.8	37.2	7.0	2.3
Wildlife	0	13.2	39.5	34.2	13.2
Fresh water	14.3	28.6	45.2	9.5	2.4
Upland forests	2.4	12.2	53.7	26.8	4.9

5.4 Coastal/marine resource utilization

5.4.1 Coastal and marine activities/good and services

Fishery and farming are identified as the two of the most important activities in the investigated area: 61 percent of the respondents engage in fishery and 51 percent in farming. A household may engage in both fishing and farming, but rain fed rice farming might be conducted irregularly when facing insufficient rice supply. Other main activities are garment and casual work (21 %), petty grocery and being a food vendor (14 %). Relatively minor activities include government servant, house/boat building and repairing, logging and wood fuel collection, fishery trading and transportation. As results of these activities, 33 percent of respondents catch crabs and 21 percent catch fishes. 21 percent said that they cultivated upland crops, 19 percent rain fed rice and 11 percent vegetables. The table below also shows types of use for each marine/coastal good and service.

It was reported that during the past several months corals and sea grasses were also exploited for trade and the harvest was carried out mostly by outsiders from the nearby provinces, and especially from Vietnam. The marketable value of these resources, however, was not known.

Table 8. Coastal and marine activities

Coastal and Marine Activities	Percent respondents noted
Fishery	60.5
Farming	51.2
Worker	20.9
Petty grocery and food vendor	14.0
Government servant	7.0
House/boat building and repairing	7.0
Logging and woodfuel collection	4.7
Fishery trading	2.3
Transportation	2.3
Aquaculture	0.0
Tourism	0.0
Coral reef collection	0.0

Fishing

Table 9 shows the coastal and marine goods/services, and types of use by distinct activities. The fishery activities are destined on four main items of commercial value: crab, fish, squid and sea cucumbers/earthworm. Crab fishing was ranked to be dominant of other items with 32.6 percent of respondents, followed by fish (ca 21%) and finally squid of 7 percent. Although, sea cucumber and earthworm capturing was not noted by any respondents selected for interview within the community, the activity was occupied by Vietnamese seasonal fishers (from Vietnam) who reportedly paid a certain amount of money to local authorities (including community fishery head) in return for permission. The products commanded a high price and can be sold internationally. In terms of types of use, crab was caught mostly by locally made crab trap and gillnet (28.9%), fish by gillnet, hook and line (25.6%) and squid by local traps (**Fig 7**), and hook and line as well. While, sea cucumber and earthworm have no specific gear, they depended upon skill of Vietnamese fishers. Moreover, pushnet and trawl were also reportedly used by fishermen from Sihanoukville (mainland) with secret support of high ranking government officials, but individual respondents were afraid to disclose the case during focus group discussion and household interview due to personal security problems.



Figure 7. A typical squid trap used by fishers in Prek Svay Community Fishery

Because the island has mountainous features, upland farming accounted for the livelihoods of about 21 percent of respondents, followed by wet season rice farming (ca 19%) and vegetable (ca 12%). It was observed and noted that the farming work still used traditional means of draught animal (buffalo) and manual labour for home garden to grow vegetable of local herbs. Animal husbandry was uncommon for the villager. Pork, beef and chicken were all taken from mainland markets of Sihanoukville.

Aquaculture

Aquaculture was not common among fishermen, as they have not had experience on culture techniques. The aquaculture occupation depicted in Table 9 below was practiced in two forms: cage culture of snapper and crab bank which are being collectively done by committee members of Phumi Prek Svay community fishery as communal property. As it is at the demonstration phase, no households had taken this as either a primary or secondary occupation.

The two culturing systems were first introduced to community in mid 2009 by FiA officials, reportedly providing relevant farming techniques, and Danida did financial support through FiA. The purpose was to diversity the livelihood opportunities for community people with a prime attempt to reduce pressure on fishery resources. The project was for Community Fishery to manage and it was expected that other community members would consider their alternative occupations.

For the cage culture of snapper scheme, Danida has financed about 7,000 USD for the investment cost, including materials for building cages (12 cages of 3x3 m dimension) and seed (13,000 snapper fingerlings); whilst, operational cost was at the community's own expense such as feed (trash fish). Before commencing the project, the community members had undertaken a study tour to Stung Hav coastal district where cage culture has been practiced for a long time. The purpose was to solicit necessary experiences on know-how techniques of culture. The daily management was under committee members at rotational intervals of time. As of early March 2010, each individual fish reached a weight of more than 1 Kg and approximately 8,000 fishes survived. Once fish reached marketable size, market was likely to be another problem due to a sharp drop in prices (at a time of stocking, 5 USD per Kg, but now decreasing to between 3-3.5 USD a Kg).

The crab bank was initiated to increase the natural crab population within the community water. It encouraged fishers to release the egg bearing crabs, when captured from wild, into community crab cages until they completely hatched. Fishers then caught those marked crabs for the purpose.

Table 9. Coastal and marine goods and services, types of use

Coastal and Marine Activities	Goods and Services	% response	Types of Use	% response
Fishery	Crab	32.6	Crab trap, gillnet	28.9
	Fish	20.9	Gillnet, hook and line (pushnet and trawler)	25.6
	Squid	7.0	Squid trap, hook and line	7.0
	Sea cucumbers and earthworm	0.0	Manual (Vietnamese fishers)	
Farming	Upland crops (fruit crop: coconut, mango, etc)	20.9	Upland cropping and Draught animal (buffalo)	23.3
	Rain fed rice	18.6	Rain fed rice farming and Draught animal (buffalo)	20.9
	Vegetable	11.6	Home garden	7.0
Aquaculture	Snapper	0.0	Cage (12 cages of 3x3 m)	CFi
	Crab bank	0.0	Cage for hatching	CFi
Worker	Casual worker	16.3	Unskilled labour	16.3
	Garment worker	4.6	Sewing labour	4.6
Petty grocery and food vendor	Grocery items	11.6	Household shop	11.6
	Food vendor	2.3	Village centre shop	2.3
Government Servant	Local authority (village and commune)	4.7	Administration	4.7

	Seaman (navy)	2.3	Security guard	4.7
	Ranger	0.0	Law enforcement	0.0
	Fishery officer	0.0	Law enforcement	0.0
	Police	0.0	Security guard and law enforcement	0.0
House/boat building and repairing	Boat	4.7	Carpenter instruments	4.7
	House	2.3	Carpenter instruments	2.3
Logging and woodfuel collection	Timber	2.3	Chainsaw and axes	2.3
	Charcoal	2.3	Kiln	2.3
	Firewood	0.0	Chainsaw and axes	0.0
Fishery trading	Fishery products	2.3	Boats and handling facilities (freezers, etc)	4.7
Transportation	Shipping	2.3	Local boat (20-30 passengers)	2.3
Tourism	Resort development	4.7	Building siting and construction, road building	(Private co.)
	Guesthouse	2.3	6 room guesthouse	2.3 (1HH)
	Beach sight seeing	0.0	Tour guide	(0.0)
	Diving	0.0	Snorkeling, scuba	(0.0)
	Recreational fishing	0.0	Boat rental	(0.0)
	Recreational boating (rental)	0.0	Local boat (5-20 tourists)	(0.0)

Workers

Workers include casual and garment workers. The casual workers represent some 16 percent of respondents and are involved in construction, security guard work, and house maids with Royal Groups and Pro Corn. Their typical salary is in between 80-120 USD a month. There were several young villagers who sought outside job as garment workers in Phnom Penh.

Petty grocery/food vendor and Fishery trading

Petty grocers represented about 12 percent respondents, while food vendors represented some 2.3 percent. It is sometimes difficult to distinguish between these two occupations as some households have intermittently been involved in both occupations. The grocery items are supplied from Sihanoukville and reportedly regulated by the commune chief.

Within the village of Prek Svay, there are three households primarily engaged in fishery trading and they were considered rich households in the village, since trading needs relatively high investment costs (like motorized boats, freezing facilities, and cash in hand to supply their partnering fishers). Each trader has networked between 30-50 fishermen who sold the catch to the trader. In other circumstance, the traders loaned fishing gear and supplies to fishermen. The trader then sold the collected catches to whole sellers in Sihanoukville with a returned benefit of between 3-4% over the farm gate prices (from fishers). However, before the border dispute with Thailand, many of the traders in the island sold the fish products to Thailand.

Transportation

As the number of villagers is relatively small, there is one household who is engaged in transportation of a passenger shipment from and to the island and Sihanoukville. It is a locally made boat equipped with sufficient horsepower engine to carry between 20-30 passengers per trip and it operated every two days. It costs 13,000 Riel (ca 3 USD) per adult passenger for a single trip. The boat did not only serve the passengers in Prek Svay village, but also people in other villages of the island including navy, marine police and staff of private firms.

Tourism

Because the island has not yet been developed to fully function the touristic destinations, there is little number of tourists including national and foreign tourists coming to visit the island. Therefore, not many household members are involved with this occupation, except a six room guesthouse operated by village chief of Prek Svay. If there are tourists wishing to pay a visit to the island, the service including boat and guide was prepared by the tour operators at Sihanoukville. By seeing this opportunity, the community fishery leader indicated that he has planned to establish the tourist centre which would give his members an opportunity to generate additional income from the services such as boat rental and eco-guide.

Approximately 4.7 percent of respondents admitted that resort development was being under construction, but they might be involved as workers in construction and road building activities for private firms. Other tourism activities such as beach sightseeing, diving, and recreational fishing did not occur in the community area, but they might take place casually in Sok San and Koh Toch villages southward of the island. It was expected that tourists would gradually arise once the facilities are available.

Government servants

The government servants include local authorities (commune chief, village chief and their deputies), navy (seaman), rangers, fishery officers and commune police. Ranger and fishery officers did not originate in the village, they came from the mainland and were assigned to work on the island as part of law enforcement duty. None of villagers chosen for household interview worked as local police, they came from separate villages, but had an obligation to oversee the security and partially involved with law enforcement other offences of natural resource exploitation. It was reported that two local policemen joined the patrol team of community fishery. One battalion of naval soldiers are stationed on the island (their base is located on a hill between Daem Thkov and Prek Svay villages) with major duty of protection of water sovereignty of Cambodia, but they were involved in law enforcement as well when requested by competent authorities. The navy troops reportedly tactically backed the illegal fishers (operating pushnet and trawler). As navy was the first to be on island since the collapse of the Pol Pot regime (1979) and their family members registered with village, therefore two households had a chance to be chosen for interview.

House/boat building and repairing, logging and woodfuel collection

There is one household who owns a boat building yard, but required nearly ten workers from other households to help complete the task as well. The boat yard is located on the bank of Prek

Svay stream where boats could be moved in and out easily during the high tide. The yard did not only provide services to fishers within villages, but also to seasonal fishers from the mainland of Sihanouk, Koh Kong, Kampot provinces and Vietnam. As found during the field work, one household earned their living as house builders who have close connections with loggers and who supplied sawn timber for house building and a boat yard as well. There are a few households involved in wood fuel collection that includes charcoal and firewood which were for local use only. The charcoal was reportedly made not only from upland forest, but also mangrove trees. This might cause severe damage to aquatic faun habitats, if the mangrove trees are still harvested for the purpose.

5.4.2 Market Orientation and Household Consumption

Market orientation is predominantly local for such goods and services as vegetables, timber, charcoal, casual work (Table 10). Some of the grocery items go to national markets, but the majority of them (83 %) are sold in local markets. Many kinds of catch such as crabs and squids are sold in national markets. In fact, crab, one of the main catches in the area, is transported to and sold at Sihanoukville. Some crabs (8 %) and fishes (11 %) are even sold in the international market. Three quarters of crab and fish are sold in national markets and the rest in local markets. All fishery products are sold in the national market, but there was a possibility that these products were then exported to international markets by whole sellers in Sihanoukville. Agricultural products are mainly consumed at the local market, but some upland crops (11 %) go to the national market as well. The resort development was likely to be prepared for foreign tourists rather than local ones, thus it is oriented to international market.

Table 10. Household Market Orientation

Coastal and Marine Goods and Services	% Noted International market	% Noted National Market	% Noted Local Market
Crab	8.3	75	16.7
Fish	11.1	77.8	11.1
Squid	0	66.7	33.3
Fishery products (trading)	0	100	0
Vegetable	0	0	100
Rain fed rice	0	0	100
Grocery items	0	16.7	83.3
Upland crops (fruit crop: coconut, mango, etc)	0	11.1	88.9
Resort development	100	0	0
Shipping	0	100	0
Timber	0	0	100
Charcoal	0	0	100
Casual worker	0	0	100
Seaman (navy)	0	0	100
Local authority (village and commune)	0	0	100
Boat	0	0	100

Table 11 shows household uses of the coastal and marine goods and services. The greater part of crabs, fishes, squids and fishery products are sold while household consumption seems minor. Charcoal and timber are for sale only. So are shipping, grocery items and boats. 40 percent of vegetables, 13 percent of rice and more than 60 percent of upland crops are sold in the market. The remains of such agricultural products are consumed in the household. Table 11 gives an indication of the wages of government and different labourers in the service sector.

Table 11. Household Uses

Coastal and Marine Goods and Services	% Sold	% Household Consumption	% Donation/Leisure
Crab	90	10	0
Fish	100	0	0
Squid	100	0	0
Fishery products (trading)	100	0	0
Vegetable	40	60	0
Rain fed rice	12.5	87.5	0
Grocery items	100	0	0
Upland crops (fruit crop: coconut, mango, etc)	66.7	33.3	0
Resort development	100	0	0
Shipping	100	0	0
Timber	100	0	0
Charcoal	100	0	0
Casual worker	100	0	0
Seaman (navy)	0	100	0
Local authority (village and commune)	0	50	50
Boat	100	0	0

5.5 Impact, threat and problem of Coastal/marine resource use

5.5.1 Threats to coastal management

The two major perceived threats in the area are overfishing and solid waste. More than 80 percent of respondents noted both as threats. Overfishing in a Cambodia context can be described as the use of illegal gear and destructive capturing practices. The severely destructive fishing gears as noted by the community people are those of push net and trawl reportedly operated by powerful commercial fishers supported by armed forces. These two types of gears have caused serious damage to coral and sea grass beds. The community emphasized that they were unable to tackle these problems.

In fact it was observed during the site visit that non-degradable waste such as plastic bags were littered in certain parts of the coastal area. About half said clearing of mangrove forests was a threat and 40 percent answered that anchor damage and sand dredging were threats. 28 percent worried about pollution in the area as wastewater from settlement buildings directly discharged

into the sea, and 19 percent said coral bleaching is a threat to the health of coastal resources. The coral bleaching was believed to have been caused by concentrated sediments via push net and trawler fishing.

Table 12. Threats to coastal management

Identified threats	Percent noted this threat
Overfishing	86
Solid waste	84
Clear cutting mangrove	49
Anchor damage	40
Sand dredging	40
Pollution (wastewater, oil spill, etc)	28
Coral bleaching	19
Others	26

5.5.2 Resource use conflict

Because the island is relatively large and rich in aquatic resources of its surrounding waters, the many fishers from neighbouring provinces have preferred fishing around the island. Some of those, however, may realize the community fishery area, but there are no alternative places to fish. As the current capacity of community fishery's executive committee is weak and lacking of patrolling resources, they were unable to carry out regular patrols over large areas of community fishing ground. As such there have been frequent encroachments by outside fishermen. For instance, buoyant deployed in order to mark the boundary of community fishery area are frequently devastated by outsiders, above all for those who operated push net and trawler gears.

When asked, the community people said that they were uncertain about their formal tenure. This is because the whole island was granted by the government to the Royal Groups for development of touristic facilities. Since the company came to the island, it has not made any clear indication as to whether the existing community is permitted to stay or relocated to another part of the island. Likewise, conversion of forest land into hotel, resort and leisure grounds is likely to cause large scale deforestation which subsequently accelerates soil erosion and finally suffocates corals leading to widespread bleaching. These uncontrolled development activities and their side effect would cause serious environmental effects on local people whose livelihoods are entirely reliant upon marine fishery resources.

5.6 Coastal and Marine Resource Governance

5.6.1 Existing legal framework

There appeared to be sufficient legal framework for marine and coastal resource management in Cambodia. These laws and regulations have their valid effect over the nation. For the case of our studied site of Koh Rong, these existing laws and regulations are worthwhile to consider, but most relevant ones are briefed in the following.

- Recent Anukret (sub-decree) on designation of fishery resources under endangered status (August 2009). The sub-decree has listed 28 marine fauna species as endangered animals largely according to CITES. Among those, coral and sea anemones were also included. According to this sub-decree, the coral was categorized into two common groups, hard and soft, with about 70 species (*Anthozao spp.*) which were found in the waters around the islands of Koh Rong, Koh Rong Sanlem, Koh Sdach, and others, covering a total area of approximately 2,800 ha.
- Preach Reach Kret (Royal Decree) on Creation of Community Fishery (2005) and Anukret (sub-decree) on Management of Community Fishery (2005). These have legally permitted local people to form and establish community fishery for sustainable utilization and conservation.
- Law on Protected Areas (2008) which can be applied on both terrestrial and aquatic ecosystems. Marine Protected Area can also be under this law.
- Law on Fisheries (2007) enforced over fishery resources management and protection of critically endangered aquatic fauna and flora. It was reported that FiA is currently undertaking assessment and a study in order to designate a marine fish sanctuary in area around Koh Rong and Koh Rong Sanlem islands.
- Land Law (2001) applicable for land tenure and title.
- Law on Environmental Protection and Natural Resource Management (1996) applicable for terrestrial and aquatic resources.
- Law on Forestry (2002)
- Law on Commune/Sangkat Administrative Management (2001)
- Anukret (Sub-decree) on Environmental Impact Assessment (1999)
- Anukret (Sub-decree) on Water Pollution Control (1999)
- Anukret (Sub-decree) on Solid Waste Management (1999)

5.6.2 Informal tenure and rules, Customs and traditions relevant to coastal/marine resource management

For the present mechanism of natural resource management in Cambodia, formal and informal rules and regulations are often practiced in combination for highly effective enforcement. As observed during the site visit, there were no noticeable informal tenure rules over resource use rights. Fishermen in the area are able to go fishing anywhere they can in order to obtain adequate catch to support their subsistent living. However, outside fishermen are not allowed to do fishing in the community fishery area, if the permit was not granted by a community leader.

Fishers of Khmer ethnicity have got along amongst themselves, while Muslim (Cham) was likely to be socialized with Khmer, since there is one household within the community. Vietnamese fishers have a preference to work within their ethnicity, as they have targeted different fish species like sea cucumber and marine earthworm, whereas the former two have had no skill on the species. For tenure over farmland, the existing people always follow their ancestors' practices and properties and simply cultivated the land cleared by the ancestors (parents or grandparents, etc). While, the new immigrants could claim upland forest area for agricultural purposes by permission from local authorities (village or commune chiefs).

As many of the inhabitants emigrated from the mainland of various provinces and more than ninety percent are ethnic Khmer, customs nor tradition are far different from the mainland. However, in regard to fishing practices, fishers have organized small festivals for Neak Ta and Yeay Mao (spirit) in the area, by offering food including chicken, pork and cake, and spray for good catch. This festival is usually organized before the fishing season, particularly during the early raining season during which the main catch occurs.

5.6.3 Institutions and stakeholders

In terms of coastal/marine resource management, Cambodia seems to have plenty of management bodies laid down from the central to the grassroots level. The central ones that have direct control include Fisheries and Forestry Administrations of Ministry of Agriculture, Forestry and Fisheries; and Ministry of Environment. At the provincial level, there are line departments whose staffs (fishery officer, forester, and ranger) work closely with local authorities and community on protection and conservation of the resources.

The total sea area allocated to community fishery covers an area large as 7,447 ha, including coral reef, sea grass bed and mangrove, of which some 15 ha were allocated for strict protection (coral and sea grass). Until present, the community has the total supported members of 173 households from Prek Svay and unregistered Sok San villages. The community is governed by an elected group of committee members encompassing 9 persons who have distinct functions such as chief, vice chief, secretary, cashier, patrol team leader, etc. In order to have a smooth implementation, the community was teamed up into 1) patrol, aquaculture (cage culture), and crab bank. The patrol which is a slightly dangerous task required a strong cooperation of two local policemen, making up the team of six persons (four from community). As noticed during the site visit, there was an imbalance of gender in the committee members of the organization, but there is currently one women. Furthermore, community people expressed the interest of forming the education team in order to deal with littered solid waste and intended to establish an incinerator for combustion of non-degradable waste, avoiding direct dumping into the ocean.

By interpreting the data from the household survey, formal and informal organizations appeared to exist. Many of them (>70 %) held memberships for a community fishery association and religious worship groups. 16 percent join a fishery trade group and 12 percent are in a self help group. 9 percent is involved in a saving group, local NGOs such as CCS Italy and FACT, and tour network (probably from Sihanoukville). 23 percent of the respondents said they were associated with private companies, for instance, Pro Corn, Royal Groups and Marine Conservation Cambodia. In the mean time, FACT (Fisheries Action Coalition Team, local NGO) has undertaken the appraisal of community situations for potential support of community capacity building and networking. While, CCS Italy was reportedly supporting educational infrastructure for children on the island. In addition, the Marine Conservation Cambodia, a local private firm administered by Englishmen, has helped community fishery in Koh Rong Samlem island for conservation of marine resources, and supported healthcare services. At the same time, the firm also operated ecotourism, especially diving. The firm, however, has extended its services of health care to community fishery in Koh Rong as well.

As the two islands of Koh Rong and Kong Rong Samlem are home to a variety of corals, the Coral Cay Conservation based in Philippines on the invitation of Fisheries Administration has launched a project entitled “Cambodia Reef Conservation Project”. The overall project goal was

intended to establish the long term conservation measure of no-take zone in the area. During the pilot phase of August to September 2009, the project conducted extensive survey to assess the current status of coral resources, fish, sea grass and mangrove forest.

Table 11. Membership in stakeholder organizations

Noted organizations for membership	Percent respondents
Community fishery	72
Religious worship (belonging to local temple)	88
Fishery trade group (Eg. village middleman, outside trader, etc.)	16
Self help group	12
Saving group	9
Local NGOs (Eg. CCS Italy, FACT, etc.)	9
Tour network (informal)	9
Private company (Eg. Pro Corn, Royal Group, Marine Conservation Cambodia)*	23

*Private company includes Pro Corn owned by Australia is developing Koh Oun island and Royal Group owned by Oknha Kit Meng for Koh Rong, Marine Conservation Cambodia run ecotourism (diving) by Paul Freber in Koh Rong Samlem island.

5.6.4 Household attitudes and perceptions towards coastal/marine resource management

In this section, household attitudes and perceptions towards coastal/marine resource management are analyzed. The first three questions are designed in order to assess how the respondents consider the indirect non-market value. 67 percent of the respondents considered that the reefs were important for protecting land from storm waves. 73 percent said clearing coral reefs could reduce the quality of fishing while 58 percent of them answered that mangroves were important to marine ecology and clearing them could adversely affect the fish habitat. Question (4) is related to existence non-use value. 67 percent of the respondents think that coral reefs are important not only for fishing, but also for diving. Question (5) and (7) assess the perception of bequest value. More than 95 percent said that the future generations should also enjoy the mangroves and coral reefs and 88 percent admitted that they should restrict development in some coastal areas so that the future generations would be able to have natural environments. These figures clearly indicate that the residents place high bequest value to the marine and coastal environment. Question (6) and (8) are about existence value. 95 percent of the respondents answered that fishing should be restricted in certain areas even if no one ever fishes in those areas just to allow the fish and coral to grow, while 67 percent of them think sea grass beds have value to people. Question (9) asks about direct non-market value. More than 95 percent of people think that an area with diverse coral reef could lead to an increase of tourists to the area. Finally, almost all respondents answered that they were willing to participate in protection and conservation of coastal and marine resources. This is chief reason why they join community fishery.

Table 12. Non-market and Non-use Values

Value Statements	PERCENT RESPONSES				
	1 = disagree strongly	2 = disagree	3 = neither	4 = agree	5 = agree strongly
(1) The reefs are important for protecting land from storm waves.	0	4.7	27.9	32.6	34.9
(2) In the long-run, fishing would be better if we cleared the coral.	62.8	11.6	9.3	14.0	2.3
(3) Unless mangroves are protected we will not have any fish to catch.	0	2.3	39.5	2.3	55.8
(4) Coral reefs are only important if you fish or dive.	2.3	9.3	23.3	53.5	11.6
(5) I want future generations to enjoy the mangroves and coral reefs.	0	2.3	0	27.9	69.8
(6) Fishing should be restricted in certain areas even if no one ever fishes in those areas just to allow the fish and coral to grow.	0	2.3	2.3	55.8	39.5
(7) We should restrict development in some coastal areas so that future generations will be able to have natural environments.	0	2.3	9.3	53.5	34.9
(8) Seagrass beds have no value to people.	37.2	30.2	18.6	14.0	0
(9) An area with diverse coral reef, there is an increase of tourists to the area	0	0	4.7	44.2	51.2
(10) Are you willing to participate in protection and conservation of coastal and marine resources?	0	0	2.3	39.5	58.1

5.6.5 Awareness of rules and regulations

High awareness (>70%) of rules and regulations was observed for fishing, fishery trading, marine transportation and residential developing. More than 60 percent said they were aware of regulation in logging and wood fuel collection. It appears that people are well aware of rules and regulations for activities rooted in their daily life. On the contrary, even though farming and small business are common income sources in the area, only slightly over 20 percent of the people realized that there were rules and regulations for such activities. About half of the respondents are aware of the rules and regulations in aquaculture, coral reef collection and tourism.

Table 13. Awareness of rules and regulations

Coastal and Marine Activities	Percent Awareness
Fishing	95
Aquaculture	54
Farming	23
Fishery trading (middleman)	70
Tourism (hotel/resort/guesthouse development, tour guide operating, recreational fishing)	56
Residential development (building a house)	70
Petty Grocery and food vendor	23
Coral reef collecting	53
Marine Transportation	78
Logging and woodfuel collecting (upland forest and mangroves)	61
Worker (garment and casual worker)	35
Boat building and repairing	none
Others	none

5.6.6 Compliance and enforcement

Over 50 percent of the respondents answered that they were perceived to be complying with rules and regulations and that rules and regulations were enforced (above 4 in 1-5 scale with 5 being full compliance/enforcement and 1 being no compliance/enforcement).

Table 14. Compliance and Enforcement in decision making

	Percent Responses				
	5 (full compliance/ Enforcement)	4	3	2	1 (no compliance/ Enforcement)
Compliance	21	35	37	2	2
Enforcement	7	51	33	7	0

5.6.7 Participation in coastal management rules and regulations

More than 60 percent said that they have participated in public awareness raising activities and 50 percent said that they were in the management planning process (above 3 in a 1-5 scale with 1 being no participation and 5 being full participation). However, overall, the perceived participation in coastal management rules and regulations is not very high. More than 50 percent of the respondents felt that they have not participated in preparation of local by-laws, patrolling, suppression of illegal activities (law enforcement), advocacy, networking and fundraising.

Table 15. Percentage of respondents perceived each scale of participation with coastal management rules and regulations

Participation Processes	Percent Responses				
	5 (full participation)	4	3	2	1 (no participation)
Management planning	12	28	12	5	44
Boundary demarcation of community/conservation area	21	9	7	42	2
Preparation of local by-laws (internal regulation, agreement, statute, etc.)	7	21	7	5	61
Public awareness raising	7	26	28	5	35
Patrolling	16	9	7	2	63
Suppression of illegal activities (law enforcement)	14	12	7	5	61
Advocacy	2	14	5	5	56
Networking	5	14	12	2	61
Fundraising	2	12	21	0	61

5.6.8 Perceived coastal management problems and their solutions

70 percent of the respondents said that poor law enforcement was the problem in coastal management. Lack of fund and technical support (67 %) and lack of participation and commitment (63 %) were also found to be the perceived problems. 30 percent identified that poor coordination, collaboration and integration of resources among competency authorities was the issue. The respondents thought that while condemning officials committing illegal activities is important to ensure law enforcement, salary should be increased in order to give less incentive for officials to commit such activities. Education would be important not only to encourage residents to participate and commit coastal management, but also to strengthen law enforcement.

Table 16. Perceived coastal management Problems

Major problems	Percent respondents noted
Poor law enforcement	70
Lack of participation/commitment	63
Lack of fund and technical support	67
Poor coordination, collaboration and integration of resources among competency authorities	30
Others	5

Table 17. Perceived Coastal Management Solutions

Major problems	Perceived solutions	Percent respondents noted
Poor law enforcement	Condemn officials committing illegality	35
	Increase salary	14
	1 and 2	7
	Educate on coastal law	2
Lack of participation/commitment	Incentive and encouragement	7
	Education on importance of coastal and marine resources	23
	1 and 2	19
Lack of fund and technical support	Seek government support	5
	Seek support from NGOs, Donors and private firm	14
	1 and 2	40
Poor coordination, collaboration and integration of resources among competency authorities	Define clear role and responsibility	12
	Partnership and network building	14
	1 and 2	0

5.6.9 Perceived community problems and their solutions

Perceived community problems are (1) lack of participation and commitment (59 % of the respondents), (2) lack of fund and technical support (63 %), (3) conflict with outsiders (56 %) and (4) limited competency to suppress illegal activities (35 %). For the problems (1) and (2), they consider that it is important to give incentive for participation and commitment, to have advice from elder, and to give sufficient public education opportunities. Financial and technical support from public and private sectors and NGOs are essential to solve the problem (2). Possible solutions for conflict with outsiders (problem 3) include informing outsiders about boundary and in some cases, legal solutions would be necessary. In order to increase competency to suppress illegality (problem 4), possibilities of cooperation with concerned authorities should be sought.

Table 18. Perceived community problems and their solutions

Community problems	Perceived solutions	Percent respondents noted
Lack of participation/ commitment (community level)	incentive and encouragement of committed members	19
	Work with elder and education on importance of CMR	21
	1 and 2	19
Lack of fund and technical support	Commit to a model CFi	14
	Seek support from Govt., NGOs, private firm, donor and charity	28
	1 and 2	21
Conflict with outsiders (fishers from nearby communes, Koh Kong, Kampot, etc.)	Inform outsiders about boundary of CFi	14
	Solve conflicts with outsiders legally	23
	1 and 2	19
Limited competency to suppress illegal activities	Seek cooperation from concerned authorities and report to central govt. for solution	26

	Give CFi a role as judicial police	7
	1 and 2	2

5.6.10 Success in coastal management

72 percent of the respondents said that the success in coastal management in the area was because of the clear definition of role and responsibility for management members. 65 percent said that support from NGOs and stakeholders was the key to the successful management. 53 percent answered that clear and appropriate time arrangement was a factor for the success as well, 44 percent said that adequate support for the legal framework was the important factor and 28 percent, fair benefit sharing that was applied for the case of snapper cage culture.

Table 19. Success in coastal management

Success factors	Percent respondents noted
Define clear role and responsibility for management team members	72
Clear and appropriate arrangement of time over tasks to each member	53
Fair benefit sharing	28
Support from NGOs and concerned stakeholders	65
Adequate support of legal framework	44
Others	16

5.6.11 Challenges in coastal management

70 percent considered that lack of facility for patrolling and management was the challenge in coastal management. More than 60 percent said that competency was limited to suppress illegal activity of large scale. Around the same number of people answered that they were feeling that knowledge and skill levels on resource protection and conservation were low. The results imply that the better coastal management should involve capacity building as well as installation of adequate facilities for patrolling and management.

Table 20. Challenges in coastal management

Challenges	Percent respondents noted
Lack of facility for patrolling and management	70
Limited competency to suppress illegal activity of large scale (e.g. trawling, pushnet, etc)	67
Low knowledge and skill on resource protection and conservation	63
Others	9

6. Discussion and conclusions

Fishing and farming were identified as the two of the most important activities in the investigated area. In fact, farming and fishing account for 60 percent of primary income sources for the households in the village. They catch crabs, fishes and squids, and cultivate upland crops, rain fed rice and vegetables. Although most of those goods and services are sold in the local market, crabs and fishes are sold in the international market as well as in the national market, implying that fishery brings important income to the village from outside the community.

It appears that the residents are not concerned too much with resource conditions in the area except for wildlife. However, the residents feel that the two major potential threats in the area could be overfishing and solid waste. Especially, successful management in fishery seems to be essential given the fact that it is the most important income source to the community. Solid waste management is a big challenge as well since there is no proper solid waste treatment and/or dumping site on the island and non-degradable solid wastes are found to be scattered on the beach. Poor law enforcement, insufficient fund and technical support, participation and commitment are the perceived problems to overcome in order to tackle the major threats in the area.

We further break down perceived problems into the community and the management levels. At the community level, major perceived problems are lack of participation and commitment, lack of fund and technical support, and confliction with outsiders. At the management level, people considered that the successful coastal management has been achieved by defining role and responsibility for management members clearly and the support from NGOs and stakeholders. However, challenges remain in the area of facility for patrolling and management, competency to suppress illegal activities and skill and knowledge level.

Despite of those challenges and problems, some of the figures are encouraging. In the community, more than half of the respondents recognize non-market value, existence non-use value, bequest value, existence value and direct non-market value of the marine and coastal goods and environment. Especially, people consider bequest and direct non-market value very significant. The area that needs to be improved is how to relate relatively high awareness of those values to concrete actions in coastal management. Many people have been involved in public awareness raising activities, which is one of the possible reasons why the community has relatively high awareness, and management planning process. However, overall, the perceived participation in coastal management rules and regulations, preparation of local by-laws, patrolling, law enforcement, advocacy, networking and fundraising are not at a sufficient level. In fact, even though rules and regulations for fishing, fishery trading, marine transportation and residential developing are widely recognized, less number of people answered that they were well complied and enforced.

7. Recommendations for management

7.1 Law enforcement

The residents of the village perceived that the law enforcement was not sufficient. This is due to lack of capability in the enforcement organization. In order to increase capability of the organization, technical support and capacity building will be necessary. For example, patrolling and enforcement mechanism should be strengthened by collaborating with the public and private sectors and NGOs. At the same time, public education on rules and education will continue to be important.

Some respondents indicate that the low salary level of officials could have led insufficient law enforcement. We stress here that along with moral and legal approaches, the market based approach should not be ignored.

7.2 Education

For a long run, education will be one of the central issues in coastal management. Education would be important not only to publicize rules and regulations and to encourage residents to participate in and commit coastal management, but also to strengthen law enforcement.

In the village, people considered bequest and direct non-market values significant. Therefore, one idea is to imply in public education and training procedure that such values can be maximized by participating in and committing management. Another point is that it is found that many of them hold memberships of a community fishery and religious worship groups. Those two types of organization could be potential locations for public education in the future.

Technical and Financial Support

Technical and financial support, and Low knowledge and skill on resource protection and conservation were considered one of the challenges facing community from a smooth implementation of coastal/marine resource management. Therefore, the opportunity is still allowed for the community to address the challenges through:

1. Capacity building for community fishery members, especially management members, on resource protection and conservation, including enhancement of their necessary skill on monitoring resources, and results generated by such monitoring would help strengthen their capacity in resource management.
2. Diversification of their income sources in order to reduce pressure on fishery resources (fishing as primary source for most of residents). The potential livelihood activities should be explored and introduced where appropriate, such as ecotourism.
3. Community based solid waste management should be introduced so as to deal with the issue of solid waste littering within the village.

7.4 Institutional framework

Installation of appropriate institutional framework should be considered. We found that almost all the respondents answered that they were willing to participate in protection and conservation of coastal and marine resources. We should think about taking advantage of the positive attitudes of the residents toward the coastal management.

7.5 Possible future impacts

A 2 billion dollar development has been planned for the island. The detailed plan is yet to be decided and therefore its impacts are not yet assessed. However, it is apparent that impacts of the development will not be negligible in the region. Careful planning and involvement of the local residents in the planning process are important in order to minimize the adverse impacts of the development and to raise awareness of the residents to the changing environment. Such local involvement would facilitate the future coastal management as well.

8. Lessons Learned

The SocMon method has been developed specifically for the Asian context as a resource guideline. However, it may not fill in all situations of each country, as others have inherently born slightly different forms of management, legal framework, policy and law, livelihood activities, formal/informal resource management, and tradition and custom. Hence, the method might be adapted slightly according to each country if sound appropriate.

As discussed in methodology section, for KS1, it should be included with new indicators such as history of the study area, geographical patterns and status of natural resources were also added for the in-depth understanding of community settings. We also introduced the community mapping (participatory mapping) in order to quickly craft the data on above indicators.

As time and budget constraint, we used an additional data gathering method of focus group discussion in combination of key informant interview and secondary sources. However, key informant interview was also employed in order to glean additional data for specific purpose and in-depth understanding of local issues to complete and cross-check the data generated by the focus group discussion.

For the indicators of coastal and marine activities that are definitely needed to simplify so that community members (participants joining focus group discussion) are able to easily understand and fill in the form. In this regard, this may entirely be dependent upon individual researcher or facilitators' skills in order to extract as much information as possible from the participants with careful manner.

The opened questions of household indicators such as H9, H17, H18, H21, H22, H23, H24, H25, H26, and H27 should be considered to include in exercise of focus group discussion. This would particularly help us collect the overall answers towards each question given by the normal community people. The answers should be scrutinized carefully in order to standardize the answers once applied during the household survey. By doing so, it would save us a lot of time for entering and cleaning data as well as analysis.

References

- CRCP Team. (2009). Cambodia reef conservation project monthly update. Retrieved on 2 March 2010, from website: <http://www.coralcay.org/content/view/841/281/>.
- Mam, K. (2002). Coral reef and seagrass in Cambodia. *SWS Bulletin*: 18-21.
- MOE. (2005). *State of the coastal environment and socio-economy of Cambodia for 2005*. Danida funded Integrated Coastal Zone Management-Cambodia. Phnom Penh, Cambodia.

- MoE/IDRC. (1995). *Mangrove Forest Resources and Local Communities, Koh Kong province, Cambodia*. Phnom Penh, Cambodia.
- Sihanoukville Municipality. (2001). *Sihanoukville coastal development strategy*. Sihanoukville, Cambodia.
- Touch S.T. & Todd B.H. (2003). *The inland and marine fisheries trade of Cambodia*. Royal Government of Cambodia and Oxfam America, Phnom Penh, Cambodia.
- van Bochove, J.W., Sandström, M., & Raines, P. (2009). *Cambodia reef conservation project: Pilot project report in partnership with Fisheries Administration and Coral Cay Conservation*. Retrieved on 4 March 2010, from website: http://www.coralcay.org/component/option,com_docman/task,cat_view/gid,191/Itemid,393/.

Appendix 1 A: Checklist for Key Informant Interview/Focus Group Discussion

I. Community Level Demography

KS1. Study area:

- Boundary (including periphery (m))
- Area (ha)
- History of the area
- Infrastructure (road, buildings, settlement area, school, market, clinic, temple, hotel-resort-guesthouse, electricity, navy base, police office, marine ranger office, mobile phone antenna, etc)
- Geographical patterns (settings): Mountain, plateau, lowland, pond, stream, gallery, sea channel, farmland (rice, upland crop)
- Resource mapping: forest, wildlife, coral reef, mangrove, fish spawning ground, marine protected area, fishing activities take place, transportation way, community area, etc.

Tools: group discussion and participatory resource mapping with village head and elder people.

Materials: Flip chart, pen, clippers, scissors, photocopied map with large or medium scales (50.000, 100,000), plastic bags,

KS2. Population: total.....Female.....

KS3. Number of households:.....(Families).....

KS4. Migration rate (2009):

KS4.1. Percentage of people moves in.....From where.....?

KS4.2. Percentage of people moves out.....To where.....?

KS5. Age: What percent of the people in the study area are currently: ____ 0-18; ____ 19-30; ____ 31-50; ____ over 50

KS6. Can be calculated based on KS2

KS7. Education level of people in percentage

Age classes	Primary School	Secondary	High	University
16-18				
19-30				
31-50				
Over 50				

KS8. Literacy: What percentage of population is literate (can read and write)?

KS8.1. Can read.....?

KS8.2. Can write.....?

KS9. Ethnicity: What is the ethnic make-up of the study area (percent of each major ethnic group in the study area):

Ethnicity	Percentage
Khmer	
Muslim	
Thai	
Vietnamese	

Others	
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KS10. Religion: What is the religious make-up of the study area (percent of each major religious group in the study area)?

Religion	Percentage
Buddhism	
Muslim (Ala)	
Christian	
Others	

KS11. Language: What are the major languages spoken in the study area (percent of each major language in the study area)?

Language	Percentage
Khmer	
Thai	
Vietnamese	
Others	

KS12. Occupation: Complete the following table

Major occupations in community	Percent of working population conducting this occupation as primary occupation	Number of people conducting this occupation as primary occupation	Percent of working population conducting this occupation as secondary occupation

II. Community Infrastructure

KS13. Community infrastructure as listed KS1

III. Coastal and Marine Activities

KS14–23. Activities, Goods and Services, Types of Use, Value of Goods and Services, Goods and Services Market Orientation, Use Patterns, Levels of Impact, Types of Impact, Level of Use by Outsiders, Household Use:

Coastal * and Marine Activities	Coastal and Marine Goods and Services	Types of Uses (primary)	Value of Goods and Services	Goods and Services Market Orientation (primary)	Use Patterns	Level of Impact	Types of Impact (primary)	Level of Use by Outsiders	House-hold Use (primary)

* Brainstorm to list all possible activities in the area and then fill in next to columns

KS24. Stakeholders in coral reef and other marine resource management

Coastal activity	Stakeholder group 1	Stakeholder group 2	Stakeholder group 3
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IV. Governance

KS25–29. Management Body, Management Plan, Enabling Legislation, Resource Allocations, Formal Tenure and Rules:

Coastal Activity	Management Body(s) (Yes/No) & Name	Management Plan (Yes/No)	Enabling Legislation (Yes/No)	Number of Staff	Budget	Formal Tenure Arrangements (Yes/No)	Relevant Rules and Regulations (Yes/No)

KS30. Informal Tenure and Rules, Customs and Traditions
Complete the following table:

Coastal Activity*	Customs and Traditions	Informal Tenure Arrangements	Informal Rules

* Based on KS14

KS31. Stakeholder participation

Stakeholders/Activities	Meeting	Awareness Raising	Patrol	Crackdown illegal activity	Etc.

KS32. Stakeholder and community organization

Community organization	Formal or informal	Main function	Influence (on coastal management, community issues, both, none)

H9. Household income sources

Sources/Ranks	Primary	Secondary	Tertiary	Other
Source 1				

H17. Perceived threats

Threats (only five)	Level of severity*
Overfishing	

Coral breaching	
Etc	

* High (3), medium (2), low (1)

H21. Participation in decision making (1= no participation, 5 = fully active participation)

H21.1. Management planning

H21.2. Boundary demarcation of community area

H21.3. Preparation of local by-laws (internal regulations, agreement, statute)

H21.4. Public awareness raising

H21.5. Patrolling

H21.6. Suppression of illegal activity

H21.7. Etc.

H22. Membership of stakeholder organizations:

H22.1. community fishery or Community marine protected area

H22.2. Local NGOs

H22.3. Religion association (worship)

H22.4. Tour association

H22.5. Self help group

H22.6. Saving group

H22.7. Fishery trade group,

H23-24. Perceived coastal management problems and solutions:

Problems (H23)	Solutions (H24)	Remarks
H24.1. No legal status		
H24.2. Lack of people participation		
H24.3. Lack of funding and technical support		
Etc.		

H25. Perceived community problems:

Problems	Solutions	Remarks
H25.1. Conflict with others		
H25.2.		
H25.3.		
Etc.		

H26. Success in coastal management

Factor 1

Factor 2

Factor 3, etc.

H27. Challenges in coastal management

Factor 1

Factor 2

Factor 3, etc.

H28. Material style of life

Types of house: Concrete, wood, boat

Type of roof: tile, tin, wood, thatch, plastic

Type of outside structural walls: tiled, brick/concrete, wood, thatch/bamboo

Windows: glass, wooden, open, none

Floors: tile, wood, cement/concrete, bamboo, dirt, plastic

Tool: observation and record

Additional data to be considered for collection by Focus group discussion:

1. Coastal and marine resources (H16): Fish, coral reef, seagrass, mangrove, freshwater, etc, and ranking of their conditions (5-very good, 4-good, 3-not good not bad (normal), 2-bad, 1-very bad) (illustrate in table)
2. Species of coral reef
3. Timeline for resource harvesting
4. Fishing gear for particular species
5. Marketing channel and arrangement of exploited resources

Coastal and Marine Activities	Coastal and Marine Goods and Services	Types of Household Uses (Methods)	Household Market Orientation	Household Uses
1				
2				
3				

III. ATTITUDES AND PERCEPTIONS

H15. Non-market and Non-use Values:

Indicate degree of agreement with the following statements using the scale: agree strongly (5); agree (4); neither agree nor disagree (3); disagree (2); disagree strongly (1).

_____ H15.1. The reefs are important for protecting land from storm waves (indirect non-market value).

_____ H15.2. In the long-run, fishing would be better if we cleared the coral (indirect non-market value).

_____ H15.3. Unless mangroves are protected we will not have any fish to catch (indirect non-market value).

_____ H15.4. Coral reefs are only important if you fish or dive (existence non-use value).

_____ H15.5. I want future generations to enjoy the mangroves and coral reefs (bequest non-use value).

_____ H15.6. Fishing should be restricted in certain areas even if no one ever fishes in those areas just to allow the fish and coral to grow (existence value).

_____ H15.7. We should restrict development in some coastal areas so that future generations will be able to have natural environments (bequest value)

_____ H15.8. Seagrass beds have no value to people (existence value)

_____ H15.9. An area with diverse coral reef, there is an increase of tourists to the area (direct non-market value)

_____ H15.10. Are you willing to participate in protection and conservation of coastal and marine resources?

H16. Perceptions of Resource Conditions:

How would you describe current coastal resource conditions on a scale from very good (5), good (4), not good not bad (3), bad (2) to very bad (1):

Fish _____; Coral reefs _____; Seagrass _____; Mangroves _____; wildlife _____; Fresh water _____; Upland forests _____; Others _____

H17. Perceived Threats: What are the top 5 major threats to the health of coastal resources?

Yes/No

H17.1. Overfishing	H17.5. Anchor damage
H17.2. Solid waste	H17.6. Sand dredging
H17.3. Pollution (wastewater, oil spill, etc)	H17.7. Coral bleaching

H17.4. Clear cutting mangrove	H17.8 Others:
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H18. Awareness of Rules and Regulations:

Are there rules and regulations related to (yes or no)?

	Coastal and Marine Activities	Yes	No
H18.1	Fishing		
H18.2	Aquaculture		
H18.3	Farming		
H18.4	Fishery trading (middleman)		
H18.5	Tourism (hotel/resort/guesthouse development, tour guide operating, recreational fishing)		
H18.6	Residential development (building a house)		
H18.7	Petty Grocery and food vendor		
H18.8	Coral reef collecting		
H18.9	Marine Transportation		
H18.10	Logging and woodfuel collecting (upland forest and mangroves)		
H18.11	Worker (garment and casual worker)		
H18.12	Boat building and repairing		
H18.13	Others		

H19. Compliance:

On a scale of 1 to 5 (1 =no compliance, 2=little compliance, 3=compliance, 4=medium compliance, 5=full compliance), to what extent do people comply with coastal management rules and regulations? _____

H20. Enforcement:

On a scale of 1 to 5 (1 =no enforcement, 2=little enforcement, 3=enforcement, 4=medium enforcement, 5=full enforcement), to what extent are the rules and regulations enforced? _____

H21. Participation in Decision-making:

On a scale of 1 to 5 (1=no participation, 5=fully active participation), to what extent do you participate in coastal management decision-making of the following processes?

Processes	1	2	3	4	5
H21.1. Management planning					
H21.2. Boundary demarcation of community/conservation area					
H21.3. Preparation of local by-laws (internal regulation, agreement, statute, etc.)					
H21.4. Public awareness raising					
H21.5. Patrolling					
H21.6. Suppression of illegal activities (law enforcement)					
H21.7. Advocacy					
H21.8. Networking					
H21.9. Fundraising					
H21.10. Others_____					

H22. Membership in Stakeholder Organizations: Is someone from your household a member of a stakeholder organization? Which organization?

Organizations	Yes	No
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H22.1. Community fishery		
H22.2. Religious worship (belonging to local temple)		
H22.3. Fishery trade group (Eg. village middleman, outside trader, etc)		
H22.4. Self help group		
H22.5. Saving group		
H22.6. Local NGOs (Eg. CCS Italy, FACT, etc.)		
H22.7. Tour association		
H22.8. Private company (Eg. Pro Corn developing Koh Rung island owned by Oknha Kit Meng, Marine Conservation Cambodia run by Paul Freber in Koh Rong Samlim island)		
H22.9. Others_____		

H23. Perceived Coastal Management Problems: Aside from threats, what do you see as the three major problems facing coastal management in the community?

Major Problems	Check only three
H23.1. Poor law enforcement	
H23.2. Lack of participation/commitment	
H23.3. Lack of fund and technical support	
H23.4. Poor coordination, collaboration and integration of resources among competency authorities	
H23.5. Others_____	

H24. Perceived Coastal Management Solutions: What do you see as solutions to these problems? Check only three by following H23

Major Problems	Solutions
24.1 Poor law enforcement	<ol style="list-style-type: none"> 1. Condemn govt. officers and others who commit illegal activities 2. Provide sufficient salary
24.2 Lack of participation/commitment	<ol style="list-style-type: none"> 1. Provide incentive/encouragement (appreciation letter, plaque, medal, etc) 2. Education on importance of coastal resources to their livelihood and their children
24.3 Lack of fund and technical support	<ol style="list-style-type: none"> 1. Seek government support 2. Seek targeted NGOs, donors and private firm support
24.4 Poor coordination, collaboration and integration of resources among competency authorities	<ol style="list-style-type: none"> 1. Define clear role and responsibility 2. Encourage partnership
24.5 Others_____	<ol style="list-style-type: none"> 1. _____ 2. _____

H25. Perceived Community Problems: What are the three major problems facing the community? Check only three

Major Problems	Solutions
H25.1. Lack of participation/commitment (community level)	<ol style="list-style-type: none"> 1. Provide incentive/encouragement (appreciation letter, plaque, medal, etc) for

	<p>recognition of outstanding work devoted to community</p> <p>2. Work with elder people in community and education on importance of coastal resources to their livelihood and their children</p>
H25.2. Lack of fund and technical support	<p>1. Conduct ourselves as a modal community, thus govt. and donor will support (help ourselves first, then ask others later)</p> <p>2. Seek support from govt., NGOs, private firm, individual donors</p>
H25.3. Conflict with outsiders (fishers from nearby communes, Koh Kong, Kamport, etc.)	<p>1. Tell them about community fishery exist</p> <p>2. Solve this problem according to law</p>
H25.4. Limited competency to suppress illegal activity	<p>1. Support from relevant competent authorities via reporting to central govt.</p> <p>2. Confer rights a judicial police</p>
H25.5. Others _____	<p>1. _____</p> <p>2. _____</p>

H26. Successes in Coastal Management:

What three things do you think have worked well for coastal management in the community?

Factors	Check
H26.1. Define clear role and responsibility for management team members	
H26.2. Clear and appropriate arrangement of time over tasks to each member	
H26.3. Fair benefit sharing	
H26.4. Support from NGOs and concerned stakeholders	
H26.5. Adequate support of legal framework	
H26.6. Others _____	

H27. Challenges in Coastal Management:

What three things do you think have not worked well for coastal management in the community?

Challenges	Check
H27.1. Lack of facility for patrolling and management	
H27.2. Limited competency to suppress illegal activity of large scale (eg. trawling, pushnet, etc)	
H27.3. Low knowledge and skill on resource protection and conservation	
H27.4. Others _____	

IV. MATERIAL STYLE OF LIFE

H28. Material Style of Life: For each house note:

H28.1. type of roof: 1) tile _____, 2) tin _____, 3) wood _____, 4) thatch _____

H28.2. type of outside structural walls: 1) tiled____, 2) brick/concrete____, 3) wood____
4) bamboo_____

H28.3. windows: 1) glass____, 2) wooden____, 3) open____, 4) none____

H28.4. floors: 1) tile_____, 2) wooden_____,3) cement_____,4) bamboo_____,
5) dirt_____

Appendix 2: survey costs

Appendix 3: survey team members and affiliations

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